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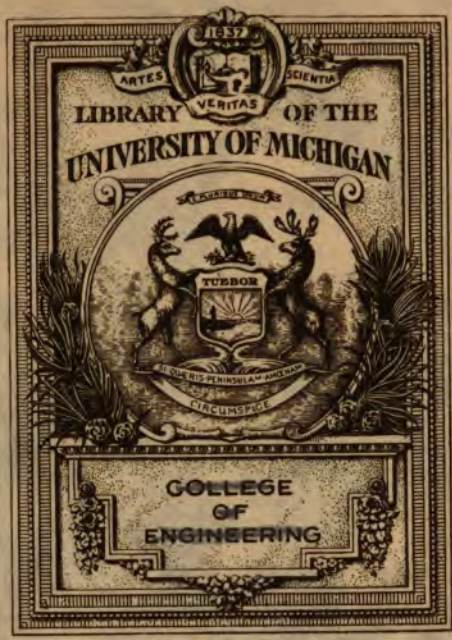


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# STATISTICS

OF

# THE AMERICAN AND FOREIGN IRON TRADES

# FOR 1883.

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## ANNUAL REPORT OF THE SECRETARY

OF THE

## AMERICAN

# IRON AND STEEL ASSOCIATION,

CONTAINING

STATISTICS OF THE AMERICAN IRON TRADE TO JANUARY 1, 1884, AND A REVIEW OF THE PRESENT CONDITION OF THE IRON INDUSTRY IN FOREIGN COUNTRIES.

---

JAMES M. SWANK,

SECRETARY.

---

PRESENTED TO THE MEMBERS, MAY 1, 1884.

---

PHILADELPHIA:

THE AMERICAN IRON AND STEEL ASSOCIATION,

No. 261 South Fourth Street.

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# PRELIMINARY STATEMENT.

HON. DANIEL J. MORRELL,

*President of The American Iron and Steel Association.*

DEAR SIR:—I have the honor to submit to you herewith, and to the members of the Association, my Twelfth Annual Report.

In the collection of statistical information for this report, and in the performance of all the other statistical and clerical work of this office, I have again had the assistance of Mr. William M. Sweet, who has long been a clerk in the office. I am under continued obligations to the Hon. Joseph Nimmo, Jr., Chief of the Bureau of Statistics at Washington, for statistical information concerning the foreign commerce of the United States, and particularly relating to iron and steel and iron ore, and I am also indebted to other gentlemen, whose names are mentioned in the body of the report, for various courtesies.

During the year which has elapsed since the appearance of my last annual report the ordinary routine business of this office has been prosecuted without abatement, and in some respects with increased activity. Extraordinary efforts were made to ascertain and promptly publish the statistical condition of our pig-iron industry on the 1st of July, 1883, and again on the 1st of November. In January last the statistical condition of this industry was again ascertained and promptly published, and early in March the statistics of our iron and steel rail industries for the year 1883 were published. In November last a complete list of all the nail mills in the United States, completed or in course of erection, was prepared and published. These various publications have had a good influence in acquainting the iron and steel manufacturers of the country with the actual condition of leading industries with which they are identified, and have particularly tended to prevent an overproduction of pig iron and a consequent demoralization of prices. With regard to the other work of the office in the past year I may say of one branch of it, without going into fuller details, that never before, except in 1880, has there been so great a demand for tariff literature. Without specifying all the publications which we have distributed in response to this demand, the circumstantial statement may be made that in the seven months from October 1, 1883, to May 1st of the present year we have distributed exactly 273,725 tariff tracts, some of which embraced 24 pages, others 16 pages, others 12 pages, others 8 pages, and only a very few as low as 4 pages. These tracts were well printed on good paper. They were distributed systematically and not at hap-hazard. The work will be continued. Other tracts will be printed. So far as I am advised this Association is the only industrial organization in the United States that habitually and methodically distributes tariff literature where it is needed. It ought not to be necessary to add that other educational efforts than our



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own are required to fully check the powerful attempt that is now being made to Anglicize the industrial policy of the country.

Since my last annual report was printed the names of many prominent American iron and steel manufacturers have appeared in the obituary columns of our *Bulletin*. I recall the names of Amasa Stone, of Cleveland, who died suddenly in that city on the 11th of May, 1883, in his 66th year; Joseph Bailey, the oldest iron manufacturer at the time of his death in Berks county, Pennsylvania, who died at his residence at Pine Iron Works on the 28th of May, 1883, in his 88th year; Robert Hare Powel, of Philadelphia, who died suddenly at Saxton, Bedford county, Pennsylvania, on the 9th of July, 1883, in his 57th year; Hon. Archibald McAllister, of Royer, Pennsylvania, who died suddenly on the 19th of July, 1883, aged 69 years; Charles Wheeler, of Philadelphia, the Treasurer of this Association, who died suddenly at New York on the 16th of August, 1883, in his 56th year; Eugene T. Henry, of Oxford, New Jersey, who died on the 2d of October, 1883, in his 57th year; General George Webb, of Johnstown, Pennsylvania, who died suddenly on the 9th of October, 1883, in his 55th year; Joshua Crowther, of New Castle, Pennsylvania, who died in October, 1883, aged over 60 years; James B. Brinsmade, of Brooklyn, New York, who died on the 3d of January, 1884, from the effects of an accident, in his 60th year; W. P. Rathburn, of Chattanooga, Tennessee, who died on the 11th of January, 1884; John Griffen, of Phœnixville, Pennsylvania, eminent as an inventor, who died on the 14th of January, 1884, in his 72d year; C. Curtis Hussey, of Pittsburgh, only son of Dr. C. G. Hussey, who died at Enterprise, Florida, on the 1st of March, 1884, in his 44th year; William H. Fritz, of Bethlehem, Pennsylvania, who died at Denver, Colorado, on the 20th of March, 1884, in his 44th year; and Nathaniel C. Ward, of East Canaan, Connecticut, general manager at that place of the works of the Barnum Richardson Company, who died on the 23d of March, 1884, in his 47th year. Here are the names of fourteen iron and steel manufacturers who have died within a year. Following so closely upon the deaths of David Thomas, Peter Cooper, and James Park, Jr., which were noticed in my last annual report, the loss which the American iron industry has recently sustained is seen to have been unusually severe.

The vacancy in the list of Vice-Presidents of this Association caused by the death of James Park, Jr., has been filled by the appointment by our Executive Committee of William Metcalf, of the firm of Miller, Metcalf & Parkin, of Pittsburgh; and the vacancy in our organization caused by the death of Charles Wheeler, its Treasurer, has also been filled by the appointment of Andrew Wheeler, of the firm of Morris, Wheeler & Co., of Philadelphia. The vacancy caused by the resignation of Dr. Charles Stewart Wurts as one of our Auditing Committee has been filled by the appointment of Powell Stackhouse.

The revision of our Directory to the Iron and Steel Works of the United States is now in progress. Very Respectfully,

JAMES M. SWANK, *Secretary.*

No. 261 South Fourth Street, Philadelphia, May 1, 1884.

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# STATISTICS OF THE AMERICAN IRON TRADE FOR 1883.

## REVIEW OF THE DOMESTIC IRON TRADE IN 1883 AND DURING THE FIRST FOUR MONTHS OF 1884.

SINCE the publication of my last annual report, on the 1st of May, 1883, the unsatisfactory condition of the American iron trade as it then existed has not improved. It has steadily grown worse, but to this statement must be added the important qualification that the trade has escaped falling into that state of apprehension, stagnation, and hopelessness which successively characterized it in the years immediately following the panic of 1873. There have been, it is true, many financial failures since the beginning of 1883, but a very large proportion of these were due to other causes than a decreased demand and a decline in prices. Enterprises undertaken in good times with insufficient capital, and enterprises that are badly managed, are almost sure to fail when trade is dull.

Looking back upon the year 1883 it can be said that throughout its entire course the reactionary influences of 1882 were continued, and in an intensified degree; but it can also be said that production in all branches, except that which embraces iron and steel rails, did not greatly vary from that of 1882; that consumption kept even pace with production in all lines; and that prices receded slowly and not rapidly. If the decline in prices had been rapid and concentrated in a brief period, and not, as it was, distributed evenly throughout the year, general disaster would have been certain. Another ameliorating influence is found in the fact that, as a rule, the prices of finished products and raw materials receded uniformly—the prices of ore and fuel maintaining an equitable relation to the prices of pig iron, and the prices of pig iron to the prices of rolled iron and steel. The only noteworthy exception to the general adjustment of prices on a lower plane was furnished by the anthracite coal producers, who scarcely recognized the decline that had taken place in the prices of pig iron. If the policy of maintaining high prices for anthracite coal is insisted upon the production of anthracite pig iron must steadily decline. As our statistics will show, it experienced a serious decline in 1883, whereas the production of



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bituminous pig iron increased in the same year. With the exception mentioned the decline in prices was equitable and compensatory; the inevitable shrinkage was evenly borne by all branches. We are glad to be able to add that wages were not greatly reduced, and that such reductions as it was found necessary to make met with little resistance; nor were many workingmen discharged because there was nothing for them to do. All in all the past year was not a year to be pointed to hereafter as one of general disaster to our iron and steel industries, nor of panic, nor of overloaded markets, nor of serious decline in consumption, nor of sudden collapse in prices; but it was, nevertheless, a year of only moderate prosperity, even of less prosperity than its predecessor had brought, and as such it must pass into history.

With the close of 1883 the decline in the prices of iron and steel was partially arrested, and the quotations of December have since been but slightly reduced in some lines and in others have been fairly steady. The demand since the 1st of January has, however, been sluggish, and indications point to an aggregate production of iron and steel in 1884 that will be less than that of 1883. The demand for steel rails, and for iron and steel for cars and locomotives and for bridges and other structural purposes, is less than it was a year ago, and probably less than it was six months ago. The shrinkage in railroad building, which will be more marked in 1884 than in 1883, must correspondingly affect the consumption of heavy iron and steel products. It is perhaps too soon to estimate closely the effect in 1884 of the existing business reaction upon the minor uses of iron and steel—upon the consumption of hardware, tools and implements of all kinds, machinery, stoves and other castings, wire for fencing, wagons and carriages, etc., but it is significant that the farmers, who consume fully one-half of all the iron and steel that is not consumed by the railroads, have a large surplus of last year's grain crop still on hand, and that, in consequence, the price of wheat has recently been lower than at any time since 1878, while the prices of other agricultural products have also declined. If the prices of wheat and other agricultural products are exceptionally low the demand for iron and steel for the uses of the farm can not be large. If the farmers are not prosperous the country at large can not be. Much will, of course, depend upon the new harvest at home and upon the coming crops abroad, but in the meantime the year will reach and pass its culminating point.

There is, however, a more hopeful view. The minor uses of iron

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and steel in this country, with its population of fifty-eight millions, require even in dull times a large aggregate tonnage of pig iron and of iron and steel in other primary and secondary stages of manufacture, and these minor uses are naturally extended with an increase in population. Not even low prices for wheat can destroy them or entirely arrest their extension. Nor is the outlook for the manufacturers of steel rails wholly unfavorable. The 120,000 miles of railroad already built must alone annually require a large quantity of rails. It is estimated by the *Railroad Gazette* that about 700,000 tons of rails were used in this country in 1882 and about 650,000 tons were used in 1883 for renewals and for new second tracks and sidings of old roads. Nor can the consumption of iron and steel for cars and locomotives be long interrupted when there are so many miles of railroad to be maintained in a fair state of equipment. The country's need of iron and steel for bridges and buildings must continue. If the supply of the home market for iron and steel can be kept chiefly in the hands of our own people, as it now is, the country's ordinary requirements for these articles in both heavy and light forms will annually furnish a vast amount of business to our iron and steel establishments. These facts and favorable probabilities are entitled to careful consideration, and to be weighed with the less favorable facts above presented, namely, the decline in railroad building and the low prices which the farmers are now receiving for their products.

There is one important consideration, however, that must be taken into account in any attempt that may be made to peer into the future of our iron and steel industries. The events of the last few years have dispelled the illusion from the minds of all but the most thoughtless that these industries or any other American industries can be indefinitely developed. There is a limit beyond which all attempts to force the development of mechanical or agricultural industries must be attended with serious loss. A country can consume and pay for just so much and no more of any product, and any surplus of that product that it may have for the supply of other countries can be disposed of, if disposed of at all, only in conformity with the same law. European countries are compelled to bend to the requirements of this law, and this country can form no exception to it. In times past we have been too prone to believe that our industrial opportunities were boundless, and that our industrial activity could, therefore, never be too pronounced or aggressive. The panic of 1873 suddenly challenged the correctness of this impression, and

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the years which immediately followed were years of humility and not of boasting. The year 1879, however, brought another period of industrial excitement, and with it a partial revival of the old belief in our industrial omnipotence. We had at last an abundance of good money; why should there not be unlimited activity and unlimited prosperity? The bounding prosperity which 1879 ushered in lasted only until 1882, since the beginning of which year the country has been gradually settling down to the industrial position it now occupies, which is midway between great exaltation and great depression, and which, joined to our experience under the panic of 1873, must virtually end the illusion that this country can not produce too much of any commodity. With this illusion dispelled; with capital taught that it need not make what the people can not buy; with would-be farmers taught that we can produce more wheat than we can sell; with immigration narrowed to reasonable bounds because labor in this country is already in excess of the demand for it; with our mechanical industries so fully developed and so skillfully managed that competition will be certain and endless, it may reasonably be expected that excited markets and inflated prices will be things of the past, while low prices will help to hold in check the evil of over-production. Steadiness in demand and supply is what the country needs and what it has conspicuously lacked in recent years. This means a slower growth than accompanies periods of industrial excitement, but a slow growth is a healthy growth. We will probably have a slow growth for some time to come, even if the importation of foreign goods be not encouraged by a further reduction of duties.

This leads to the remark that it is the unanimous testimony of business men that our general industrial condition would be much better than it now is if the nightmare of a reduction in the tariff had not rested upon the country during the past eighteen months. The mere agitation of the question of a reduction of duties, in Congress and in the columns of newspapers, although not always resulting in a change in the rates, is injurious to all productive industry, as it necessarily makes future demand and future prices uncertain. It may readily be granted that an industrial reaction from the extraordinary activity which succeeded the long period of hard times, during which period the country gradually worked its way down to specie payments, was inevitable, but this natural reaction would not have been so sharp as it has been if it had not been accompanied by the agitation for a reduction of duties. This agita-

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tion has lasted, as we have said, for eighteen months, or ever since the Tariff Commission presented its report, (which was followed by the enactment of the present tariff,) and since the almost simultaneous election of the House of Representatives of the present Congress. It will continue as long as the present Congress is in power. If we could have a law that would prohibit changes in the tariff oftener than once in every ten years the industries of the country would rest upon a more stable foundation than they now do. It is earnestly to be hoped that after the present agitation has run its course all the industries of the country will be permitted to enjoy a long period of rest from legislative interference.

Meanwhile the fact is worthy of notice that in Europe the industrial situation is not even so favorable as it is with us. The iron and steel industries of almost every European country are especially depressed at the present time. If there has been a tendency to overproduction of iron and steel on this side of the Atlantic, the same tendency has been manifested on the other side, and there, as here, the results are seen in low prices and idle establishments. The wonderfully productive power of modern machinery as an influence in creating glutted markets has not yet been sufficiently recognized or guarded against in any manufacturing country.

## THE PRODUCTION OF IRON AND STEEL IN 1882 AND 1883.

The production of iron and steel in the United States in 1883 is given in the following table in comparison with that of 1882.

| PRODUCTS. | Net tons. | |
|---|---|---|
| | 1882. | 1883. |
| Pig iron | 5,178,122 | 5,146,972 |
| All rolled iron, including nails and excluding rails | 2,265,957 | 2,283,920 |
| Bessemer steel rails | 1,438,155 | 1,286,554 |
| Open-hearth steel rails | 22,765 | 9,186 |
| Iron rails | 227,874 | 64,954 |
| Kegs cut nails and spikes, included in rolled iron | 6,147,097 | 7,762,737 |
| Crucible steel ingots | 85,089 | 80,455 |
| Open-hearth steel ingots | 160,542 | 133,679 |
| Bessemer steel ingots | 1,696,450 | 1,654,627 |
| Blooms from ore and pig iron | 91,293 | 74,758 |

There was a remarkable correspondence in the production of pig iron, rolled iron, crucible steel ingots, and Bessemer steel ingots in 1882 and 1883; a marked decline in 1883 in the production of all kinds of rails, open-hearth steel ingots, and blooms from ore and pig

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iron; and a surprising increase in 1883 in the production of cut nails and spikes.

### PRICES OF IRON AND STEEL IN 1882, 1883, AND 1884.

The following table will show the range of prices for all leading iron and steel products from January, 1882, until the close of April, 1884. Monthly quotations are given, averaged from weekly quotations. The prices quoted are for a ton of 2,240 pounds, except for bar iron and nails, which are quoted by the pound and the keg respectively. Where the asterisk occurs no sales were reported.

| MONTHS. | Old T rails, at Philadelphia. | New iron rails, at mills in Pennsylvania. | Steel rails, at mills in Pennsylvania. | No. 1 anthracite foundry pig iron, at Philadelphia. | Gray forge pig iron, at Philadelphia. | Common bar iron, at Pittsburgh. Per pound. | Nails, (gross price,) at Pittsburgh. Per keg. | Gray forge pig iron, Lake ore mixed, at Pittsburgh. |
|---|---|---|---|---|---|---|---|---|
| January, 1882 | $30.00 | $48.50 | $58.00 | $26.00 | $24.00 | 2.5c. | $3.35 | $25.00 |
| February | 30.50 | 48.50 | 55.00 | 26.00 | 24.00 | 2.5c. | 3.40 | 26.00 |
| March | 29.25 | 47.50 | 54.00 | 25.75 | 23.75 | 2.5c. | 3.40 | 25.50 |
| April | 28.50 | 47.00 | 52.75 | 25.50 | 23.50 | 2.45c. | 3.30 | 25.00 |
| May | 26.75 | 44.75 | 48.75 | 25.50 | 22.75 | 2.35c. | 3.15 | 24.00 |
| June | 26.25 | 44.75 | 48.25 | 25.50 | 22.00 | 2.5c. | 3.50 | * |
| July | 26.50 | 45.00 | 48.00 | 25.50 | 22.50 | 2.5c. | 3.55 | 24.00 |
| August | 26.50 | 45.00 | 47.00 | 25.50 | 21.50 | 2.5c. | 3.60 | 24.00 |
| September | 27.00 | 44.00 | 45.00 | 26.00 | 22.00 | 2.5c. | 3.40 | 23.00 |
| October | 27.50 | 44.00 | 44.25 | 26.25 | 22.25 | 2.5c. | 3.40 | 22.50 |
| November | 27.25 | 44.00 | 42.00 | 26.00 | 21.75 | 2.2c. | 3.40 | 21.75 |
| December | 27.00 | 44.00 | 39.00 | 25.75 | 21.25 | 2.2c. | 3.40 | 21.50 |
| January, 1883 | 26.50 | * | 40.00 | 25.00 | 21.00 | 2.2c. | 3.40 | 21.00 |
| February | 26.00 | * | 39.50 | 24.50 | 20.50 | 2c. | 3.40 | 20.50 |
| March | 25.00 | * | 39.00 | 24.00 | 20.00 | 2c. | 3.40 | 20.00 |
| April | 24.50 | * | 38.50 | 23.50 | 20.00 | 2c. | 3.30 | 19.50 |
| May | 23.50 | * | 38.00 | 22.00 | 19.50 | 2c. | 3.10 | 18.50 |
| June | 22.00 | * | 38.00 | 21.00 | 19.00 | 2c. | 3.00 | 18.50 |
| July | 22.50 | * | 38.00 | 21.50 | 19.00 | 2c. | 3.00 | 18.50 |
| August | 23.50 | * | 38.00 | 22.00 | 19.00 | 2c. | 3.00 | 18.50 |
| September | 23.50 | * | 37.50 | 22.00 | 18.75 | 2c. | 2.85 | 18.50 |
| October | 23.25 | * | 37.00 | 21.50 | 18.75 | 1.9c. | 2.75 | 18.50 |
| November | 23.00 | * | 35.00 | 21.00 | 18.50 | 1.8c. | 2.60 | 18.50 |
| December | 23.00 | * | 34.50 | 21.00 | 18.00 | 1.8c. | 2.50 | 18.00 |
| January, 1884 | 22.50 | * | 34.00 | 20.50 | 18.25 | 1.8c. | 2.40 | 18.00 |
| February | 23.00 | * | 34.00 | 20.50 | 18.00 | 1.8c. | 2.60 | 18.00 |
| March | 22.75 | * | 34.00 | 20.50 | 18.00 | 1.8c. | 2.50 | 17.75 |
| April | 22.00 | * | 34.00 | 20.00 | 18.00 | 1.8c. | 2.35 | 17.50 |

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The decline in prices which is presented by this table is very great, and it is suggestive of the decline which occurred during the panic years. Indeed we have already gone below the lowest panic prices for steel rails, and in pig iron, bar iron, and nails we are uncomfortably close to the prices of 1878, which was the darkest of the panic years.

The shrinkage in the prices of leading iron and steel products during 1883 was as follows: No. 1 anthracite foundry pig iron at Philadelphia fell from $25 in January to $21 in December; gray forge pig iron at Philadelphia from $21 to $18; gray forge pig iron, lake ore mixed, at Pittsburgh, from $21 to $18; steel rails in Pennsylvania from $40 to $34.50; bar iron at Pittsburgh from 2.2 cents in January to 1.8 cents in December; nails in the same market, gross price, from $3.40 to $2.50.

The price of Connellsville coke on cars at the ovens fell from $1.35 per net ton in January to 90 cents in midsummer, from which there was a recovery to $1 in August, which was maintained until the close of the year, after which there was a decline to 90 cents. On the 1st of April last the price was advanced to $1.10. The prices of best qualities of Lake Superior iron ore at Cleveland fell $1 per ton during the year, and since the 1st of January last they have still further declined. Season contracts for Lake Superior ore were made in 1883 largely in April and May. In 1884 they have been made chiefly in February. The following table shows the prices for season contracts for both years:

| Kinds of Ore. | Gross tons. | |
|---|---|---|
| | 1883. | 1884. |
| Republic | $7.50 | $6.00 |
| West Republic | 7.50 | 6.25 |
| Barnum, Cleveland, and Lake Superior specular | 6.50 | 5.75 |
| Chapin and Menominee | 6.00 | 5.25 |
| Hematites | 4.75 | 4.50 |

## OUR IMPORTS OF IRON AND STEEL FROM 1871 TO 1883.

The foreign value of the imports into the United States from all countries of iron and steel and manufactures thereof, including tin-plates, has been as follows in the thirteen years from 1871 to 1883. A decrease of almost $20,000,000 in 1883 as compared with 1882 will be observed, but the value of the imports in 1883 was still more than half that of the "boom" year 1880.

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| Years. | Values. | Years. | Values. |
|---|---|---|---|
| 1871 | $57,866,299 | 1878 | $18,013,010 |
| 1872 | 75,617,677 | 1879 | 33,331,569 |
| 1873 | 60,005,538 | 1880 | 80,443,362 |
| 1874 | 37,652,192 | 1881 | 61,555,077 |
| 1875 | 27,363,101 | 1882 | 67,075,125 |
| 1876 | 20,016,603 | 1883 | 47,506,306 |
| 1877 | 19,874,399 | | |

In the following table we give the quantities of pig, bar, band, hoop, scroll, plate, boiler, sheet, and taggers iron, iron and steel rails, old and scrap iron, and tinplates imported into the United States from all countries from 1871 to 1883. Steel in forms for which statistics of values only are obtainable are included in the table given above. The quantities of castings, anchors, cables, and chains imported prior to 1883 are given in the table which follows, but for that year only values are obtainable, and these are included in the table above.

| Years. | Net tons. | Years. | Net tons. |
|---|---|---|---|
| 1871 | 1,278,965 | 1878 | 236,434 |
| 1872 | 1,325,034 | 1879 | 862,382 |
| 1873 | 717,761 | 1880 | 2,112,341 |
| 1874 | 337,845 | 1881 | 1,322,439 |
| 1875 | 268,477 | 1882 | 1,335,371 |
| 1876 | 228,716 | 1883 | 777,650 |
| 1877 | 236,777 | | |

The following table shows, in net tons, the details of our imports in the last six years of the articles included in the table just given.

| Commodities. | Net tons of 2,000 pounds. | | | | | |
|---|---|---|---|---|---|---|
| | 1878. | 1879. | 1880. | 1881. | 1882. | 1883. |
| Pig iron | 74,484 | 340,672 | 784,968 | 520,835 | 604,978 | 361,366 |
| Castings | 69 | 61 | 114 | 632 | 2,079 | ..... |
| Bar iron | 33,346 | 48,840 | 126,987 | 47,820 | 79,220 | 47,409 |
| Band, hoop, and scroll iron | 7 | 1,031 | 25,322 | 827 | 6,021 | 1,003 |
| Railroad bars of iron | ..... | 19,090 | 132,459 | 137,013 | 41,992 | 757 |
| Railroad bars of steel | 10 | 25,057 | 158,230 | 249,308 | 182,135 | 38,220 |
| Sheet, plate, and taggers iron | 839 | 5,550 | 11,580 | 8,411 | 13,160 | 9,114 |
| Old and scrap iron | 6,225 | 248,429 | 694,273 | 151,107 | 164,591 | 72,000 |
| Anchors, cables, chains, etc | 646 | 892 | 1,393 | 1,520 | 1,530 | ..... |
| Tinplates and terne plates | 120,808 | 172,760 | 177,015 | 204,966 | 239,665 | 247,781 |
| Total | 236,434 | 862,382 | 2,112,341 | 1,322,439 | 1,335,371 | 777,650 |

It will be seen that our imports of pig iron in 1883 were still

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large, but that the imports of rails dwindled to small proportions. The imports of bar iron and scrap iron were kept within reasonable limits, but the imports of tinplates increased, as in previous years. Our imports of tinplates in 1883 were more than double in quantity the imports in 1878. The foreign value of the tinplates imported in 1883 was $18,156,773. As about 95 per cent. of the weight of tinplates is composed of iron, and as this country could import its supply of tin from the East Indies and other countries as easily as Great Britain does, no reason exists why we should not make our own tinplates except that the duty is not sufficient to induce capital to engage in the business. *This country does not make one box of tinplates.*

Commencing with July 1, 1883, when the new tariff went into effect, the Treasury Department re-classified its statistical tables of the imports of iron and steel, and the statistics of the imports of a number of articles which were formerly lumped as manufactures of iron and steel not otherwise provided for are now separately given. The following table gives the quantities and values of these articles which were imported in the last six months of 1883.

| ARTICLES. | Six months ended December 31, 1883. | |
|---|---|---|
| | Net tons. | Values. |
| Iron and steel cotton-ties | 13,453 | $404,040 |
| Steel hoops, sheets, plates, etc | 1,041 | 102,251 |
| Steel ingots, blooms, bars, etc | 9,246 | 676,825 |
| Iron and steel wire rods | 34,658 | 1,316,740 |
| Iron and steel wire | 1,857 | 230,267 |
| Iron and steel anvils, axles, etc | 629 | 72,002 |
| Iron and steel chains | 637 | 61,803 |
| Scrap steel | 4,347 | 58,660 |
| Total | 65,868 | $2,922,588 |

*Cotton-ties are not now made in this country,* through the lack of a protective duty. During the last six months of 1883 the importations of iron and steel cotton-ties amounted to 13,453 tons, valued at $404,040—a value so low as to afford on its face clear proof of the inability of our manufacturers to compete with foreign manufacturers. The duty is 35 per cent. on "iron and steel cotton-ties, or hoops for baling purposes." The duty should be specific, and sufficient to start some of our rolling mills that are now silent. Why should not the South make its own cotton-ties?

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We regret to be compelled to say that our wire-rod industry, which supplies the raw material for barbed and other wire, rivets, screws, small bolts, etc., is injuriously affected by foreign competition—the low cost at which German manufacturers are enabled to produce steel rods, and Swedish manufacturers are enabled to produce iron rods, co-operating with the low duty imposed by the new tariff to materially check their domestic production. Since the new duty went into effect the manufacture of iron wire rods has shrunk to insignificant proportions, while that of steel wire rods has not been profitable, even with reduced wages. The duty on both products has been decided to be six-tenths of a cent per pound. We have the capacity to produce all the wire rods that the country needs.

Fuller details than are above given of our imports of iron and steel in recent years will be found in a table near the close of the domestic part of this report.

### OUR IMPORTS OF IRON ORE IN 1881, 1882, AND 1883.

The following statement shows the quantities and values of iron ore imported into the United States during the calendar years 1881, 1882, and 1883, by customs districts. Our imports of iron ore are principally derived from Spain.

| DISTRICTS. | 1881. | | 1882. | | 1883. | |
|---|---|---|---|---|---|---|
| | Gross tons. | Values. | Gross tons. | Values. | Gross tons. | Values. |
| Baltimore | 375,798 | $1,005,496 | 243,182 | $654,629 | 236,998 | $612,626 |
| Boston | 716 | 2,867 | 1,664 | 3,322 | 2,470 | 5,277 |
| Buffalo Creek | 2,492 | 7,320 | 273 | 755 | ..... | ..... |
| Champlain | ..... | ..... | 2 | 7 | 5 | 28 |
| Cuyahoga | 10,500 | 37,675 | 9,420 | 33,181 | 6,525 | 17,810 |
| Detroit | 617 | 1,646 | 48 | 98 | ..... | ..... |
| Genesee | 8,716 | 25,961 | 6,851 | 21,651 | 784 | 1,740 |
| Huron | 264 | 770 | 264 | 677 | 14 | 4 |
| New York | 196,419 | 641,344 | 145,909 | 421,776 | 36,800 | 94,236 |
| Oswegatchie | 3,418 | 10,650 | 905 | 2,783 | 942 | 2,866 |
| Oswego | 13,612 | 44,026 | 37,635 | 120,008 | 17,862 | 40,744 |
| Perth Amboy, N. J. | 13,671 | 48,323 | 31,558 | 101,859 | 10,082 | 29,189 |
| Philadelphia | 155,564 | 394,952 | 111,944 | 279,818 | 170,420 | 386,386 |
| Puget's Sound | 1,100 | 1,622 | ..... | ..... | 3,521 | 7,084 |
| Beaufort, S. C | ..... | ..... | ..... | ..... | 1,473 | 4,243 |
| Vermont | ..... | ..... | ..... | ..... | 2,979 | 5,758 |
| Total | 782,887 | $2,222,652 | 589,655 | $1,640,564 | 490,875 | $1,207,991 |

Previous to 1879 the quantity of iron ore imported into the United States was not recorded, but it did not amount to 100,000 tons in any year. The imports in 1879 amounted to 284,141 gross tons, and in 1880 they amounted to 493,408 tons. The imports in 1883 were

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less than in 1882, but there will probably be only a slight decrease in 1884 over 1883, in consequence of the opening of the mines of the Juragua Iron Company Limited, in Cuba, from which it is expected that shipments to this country will begin about the 1st of July next. This company is wholly composed of Pennsylvania capitalists. It was organized early in 1883 to develop extensive deposits of slightly magnetized hematite iron ore in the province of Santiago, in the southeastern part of Cuba, within a few miles of the coast.

The duty on iron ore was changed by the new tariff from 20 per cent. *ad valorem* to 75 cents per ton of 2,240 pounds.

OUR DOMESTIC EXPORTS OF IRON AND STEEL FROM 1871 TO 1883.

The value of the exports from the United States to all countries of domestic iron and steel and manufactures thereof from 1871 to 1883 was as follows:

| Years. | Values. | Years. | Values. | Years. | Values. |
|---|---|---|---|---|---|
| 1871 | $11,836,137 | 1876 | $11,798,459 | 1881 | $15,782,202 |
| 1872 | 10,030,125 | 1877 | 16,659,675 | 1882 | 19,029,759 |
| 1873 | 12,129,939 | 1878 | 13,260,369 | 1883 | 19,025,718 |
| 1874 | 15,389,807 | 1879 | 12,470,448 | | |
| 1875 | 16,092,906 | 1880 | 12,960,995 | | |

Our exports of iron and steel in 1883 consisted of machinery valued at $5,935,543; 275 locomotives valued at $2,650,944; saws and tools valued at $1,388,562; fire-arms valued at $1,357,686; 5,724 net tons of nails and spikes valued at $388,070; castings not specified valued at $385,262; boilers separate from engines valued at $290,177; printing-presses valued at $250,407; stoves valued at $232,713; 18,217 car-wheels valued at $181,236; 147 stationary engines valued at $170,104; 2,006 net tons of steel rails valued at $102,864; 579 tons of iron rails valued at $31,806; 4,221 tons of pig iron valued at $111,414; 1,201 tons of bar iron valued at $72,054; 330 tons of band, hoop, scroll, plate, and sheet iron valued at $29,187; 275 tons of steel ingots, bars, sheets, and rods valued at $54,350; other articles valued at $5,393,339: total, $19,025,718. The number of locomotives sent abroad in 1883 was very much larger than in any previous year, the next largest number being in 1882, when 174 were exported. In 1881 we exported only 104 locomotives.

Further details of our exports of iron and steel will be found in a table appended to the domestic part of this report.

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## THE PRODUCTION OF PIG IRON IN 1883.

The production of pig iron in the United States reached its highest point in 1882, when 5,178,122 net tons, or 4,623,323 gross tons, were produced. In 1883 our production of pig iron was very nearly as large as in 1882, being 5,146,972 net tons, or 4,595,510 gross tons. (A net ton is 2,000 pounds, and a gross ton is 2,240 pounds.) Our production of pig iron in the last five years, which include the "boom" year 1879, was as follows, in both net and gross tons.

| Years. | Net tons. | Gross tons. |
|---|---|---|
| 1879 | 3,070,875 | 2,741,853 |
| 1880 | 4,295,414 | 3,835,191 |
| 1881 | 4,641,564 | 4,144,254 |
| 1882 | 5,178,122 | 4,623,323 |
| 1883 | 5,146,972 | 4,595,510 |

The following table gives in net tons the production of pig iron in the last five years, classified according to the fuel used.

| Fuel Used. | 1879. | 1880. | 1881. | 1882. | 1883. |
|---|---|---|---|---|---|
| Bituminous | 1,438,978 | 1,950,205 | 2,268,264 | 2,438,078 | 2,689,650 |
| Anthracite | 1,273,024 | 1,807,651 | 1,734,462 | 2,042,138 | 1,885,596 |
| Charcoal | 358,873 | 537,558 | 638,838 | 697,906 | 571,726 |
| Total | 3,070,875 | 4,295,414 | 4,641,564 | 5,178,122 | 5,146,972 |

It is necessary to explain that in the fuel classification here given there is included under the head of "anthracite" all the pig iron made with mixed anthracite coal and bituminous coke. For several years this mixture of fuels in the blast furnace has become more and more popular in those iron-producing sections of the country that are usually regarded as tributary to the anthracite coal region, and even the use of coke alone as a blast-furnace fuel has made some headway in these sections. Of the production of 1,885,596 net tons of anthracite pig iron in 1883, no less than 920,142 tons, or nearly one-half of the total quantity, were produced with mixed fuel. With the opening up of a new coke field in the Clearfield region of Pennsylvania, and the continuance of the present disparity in the prices of coke and anthracite coal, it may reasonably be expected that the use of the latter fuel in the blast furnace will from year to year decline relatively with that of coke, and probably absolutely.

Notwithstanding the admixture of coke with anthracite coal, the production of anthracite pig iron in 1883 as compared with that of 1882 decreased 156,542 net tons. Upon the other hand the produc-

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tion of bituminous pig iron, which includes pig iron made with uncoked coal as well as that made with coke, increased 251,572 net tons in 1883 as compared with 1882. The production of charcoal pig iron steadily increased from 1878, when it amounted to 293,399 net tons, to 1882, when it amounted to 697,906 tons, but in 1883 it declined to 571,726 tons—a loss in one year of 126,180 net tons.

Our production of pig iron in 1882 was obtained in twenty-six States and one Territory, (Utah,) but in 1883 only twenty-four States and one Territory (Washington) produced pig iron. The two States which dropped out of the list in 1883 were Vermont and North Carolina. The following table shows the production of pig iron by States in 1883, in the order of their prominence.

| States. | Net tons. | States. | Net tons. |
|---|---|---|---|
| Pennsylvania | 2,638,891 | Georgia | 45,364 |
| Ohio | 679,643 | Colorado | 24,680 |
| New York | 331,964 | Connecticut | 19,976 |
| Illinois | 237,657 | Massachusetts | 10,760 |
| Michigan | 173,185 | Indiana | 9,950 |
| Alabama | 172,465 | Minnesota | 8,000 |
| Virginia | 152,907 | Oregon | 7,000 |
| New Jersey | 138,773 | California | 5,327 |
| Tennessee | 133,963 | Maine | 4,400 |
| Missouri | 103,296 | Texas | 2,381 |
| West Virginia | 88,398 | Washington Territory | 2,317 |
| Kentucky | 54,629 | | |
| Wisconsin | 51,893 | Total | 5,146,972 |
| Maryland | 49,153 | | |

Of the total production of pig iron in 1883 Pennsylvania produced over 51 per cent. Ohio comes next with over 13 per cent. By reference to elaborate tables in the latter part of this report it will be seen that Pennsylvania increased its production 189,635 tons from 1882 to 1883. In the same period Ohio reduced its production 19,257 tons; New York, 84,192 tons; Illinois, 122,750 tons; Michigan, 37,010 tons; New Jersey, 38,032 tons; Tennessee, 3,639 tons; Missouri, 10,348 tons; Wisconsin, 33,966 tons; Kentucky, 11,893 tons; and Maryland, 5,371 tons. Georgia, Colorado, Connecticut, Massachusetts, Maine, Indiana, Minnesota, and Oregon made but little change in their production. Of the States which, in addition to Pennsylvania, increased their production in 1883 Virginia comes first, with an increase from 87,731 tons in 1882 to 152,907 tons in 1883. Alabama also made a notable increase, its production being 112,765 tons in 1882 and 172,465 tons in 1883. West Virginia increased its production from 73,220 tons to 88,398

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tons; Texas from 1,321 tons to 2,381 tons; and California from 987 tons to 5,327 tons.

The following table shows in detail the production of charcoal pig iron in 1883. Nineteen States and one Territory (Washington) made pig iron with this fuel in the year named, Michigan being first and Alabama second in the list. Ohio seems to be losing its prominence as a producer of charcoal pig iron. The following States made only charcoal pig iron in 1883: Maine, Massachusetts, Connecticut, Michigan, Minnesota, Texas, California, and Oregon. Washington Territory also made only charcoal iron in that year.

| States. | Net tons. | States. | Net tons. |
|---|---|---|---|
| Michigan | 173,185 | Kentucky | 13,981 |
| Alabama | 57,385 | Georgia | 13,045 |
| Ohio | 40,528 | Massachusetts | 10,760 |
| Wisconsin | 39,349 | Minnesota | 8,000 |
| Pennsylvania | 38,315 | Oregon | 7,000 |
| Tennessee | 35,299 | California | 5,327 |
| Missouri | 34,112 | Maine | 4,400 |
| New York | 25,680 | Texas | 2,381 |
| Maryland | 23,807 | Washington Territory | 2,317 |
| Connecticut | 19,976 | | |
| Virginia | 16,879 | Total | 571,726 |

The following table shows in detail the production of bituminous coal and coke pig iron in 1883. Fourteen States made this quality of pig iron in that year.

| States. | Net tons. | States. | Net tons. |
|---|---|---|---|
| Pennsylvania | 1,184,108 | Kentucky | 40,648 |
| Ohio | 639,115 | Georgia | 32,319 |
| Illinois | 237,657 | Colorado | 24,680 |
| Virginia | 136,028 | Wisconsin | 12,544 |
| Alabama | 115,080 | Indiana | 9,950 |
| Tennessee | 98,664 | Maryland | 1,275 |
| West Virginia | 88,398 | | |
| Missouri | 69,184 | Total | 2,689,650 |

The following table shows in detail the production of anthracite pig iron in 1883, four States only using this fuel in that year.

| States. | Net tons. | States. | Net tons. |
|---|---|---|---|
| Pennsylvania | 1,416,468 | Maryland | 24,071 |
| New York | 306,284 | | |
| New Jersey | 138,773 | Total | 1,885,596 |

The following table shows the production of pig iron in Pennsylvania and Ohio, by districts, in the last four years.

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| | Districts. | Net tons of 2,000 pounds. | | | |
|---|---|---|---|---|---|
| | | 1880. | 1881. | 1882. | 1883. |
| Pennsylvania. | Lehigh Valley anthracite | 544,987 | 560,190 | 609,338 | 575,987 |
| | Schuylkill Valley " | 306,926 | 309,049 | 342,701 | 337,433 |
| | Upper Susquehanna " | 168,128 | 125,785 | 201,367 | 165,629 |
| | Lower Susquehanna " | 217,889 | 218,329 | 300,240 | 337,419 |
| | Shenango Valley coke | 215,313 | 198,968 | 264,078 | 290,069 |
| | Allegheny County coke | 300,497 | 385,453 | 358,840 | 592,475 |
| | Miscellaneous coke | 286,007 | 341,104 | 322,717 | 301,564 |
| | Charcoal | 43,374 | 51,908 | 49,975 | 38,315 |
| Ohio. | Hanging Rock coke | 60,316 | 77,500 | 77,364 | 82,455 |
| | Mahoning Valley coke | 226,877 | 245,737 | 258,478 | 244,265 |
| | Hocking Valley coke | 85,719 | 88,146 | 78,770 | 48,439 |
| | Miscellaneous coke | 232,105 | 232,994 | 225,634 | 263,956 |
| | Hanging Rock charcoal | 64,854 | 61,487 | 55,546 | 38,134 |
| | Miscellaneous charcoal | 4,336 | 4,682 | 3,108 | 2,394 |

The following table gives the production of anthracite, charcoal, and bituminous pig iron in the United States in the thirty years from 1854 to 1883. This is a table Americans may be proud of.

| Years. | Net tons of 2,000 pounds. | | | |
|---|---|---|---|---|
| | Anthracite. | Charcoal. | Bituminous. | Total. |
| 1854 | 339,435 | 342,298 | 54,485 | 736,218 |
| 1855 | 381,866 | 339,922 | 62,390 | 784,178 |
| 1856 | 443,113 | 370,470 | 69,554 | 883,137 |
| 1857 | 390,385 | 330,321 | 77,451 | 798,157 |
| 1858 | 361,430 | 285,313 | 58,351 | 705,094 |
| 1859 | 471,745 | 284,041 | 84,841 | 840,627 |
| 1860 | 519,211 | 278,331 | 122,228 | 919,770 |
| 1861 | 409,229 | 195,278 | 127,037 | 731,544 |
| 1862 | 470,315 | 186,660 | 130,687 | 787,662 |
| 1863 | 577,638 | 212,005 | 157,961 | 947,604 |
| 1864 | 684,018 | 241,853 | 210,125 | 1,135,996 |
| 1865 | 479,558 | 262,342 | 189,682 | 931,582 |
| 1866 | 749,367 | 332,580 | 268,396 | 1,350,343 |
| 1867 | 798,638 | 344,341 | 318,647 | 1,461,626 |
| 1868 | 893,000 | 370,000 | 340,000 | 1,603,000 |
| 1869 | 971,150 | 392,150 | 553,341 | 1,916,641 |
| 1870 | 930,000 | 365,000 | 570,000 | 1,865,000 |
| 1871 | 956,608 | 385,000 | 570,000 | 1,911,608 |
| 1872 | 1,369,812 | 500,587 | 984,159 | 2,854,558 |
| 1873 | 1,312,754 | 577,620 | 977,904 | 2,868,278 |
| 1874 | 1,202,144 | 576,557 | 910,712 | 2,689,413 |
| 1875 | 908,046 | 410,990 | 947,545 | 2,266,581 |
| 1876 | 794,578 | 308,649 | 990,009 | 2,093,236 |
| 1877 | 934,797 | 317,843 | 1,061,945 | 2,314,585 |
| 1878 | 1,092,870 | 293,399 | 1,191,092 | 2,577,361 |
| 1879 | 1,273,024 | 358,873 | 1,438,978 | 3,070,875 |
| 1880 | 1,807,651 | 537,558 | 1,950,205 | 4,295,414 |
| 1881 | 1,734,462 | 638,838 | 2,268,264 | 4,641,564 |
| 1882 | 2,042,138 | 697,906 | 2,438,078 | 5,178,122 |
| 1883 | 1,885,596 | 571,726 | 2,689,650 | 5,146,972 |

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The following table shows the production of spiegeleisen in the United States since 1875. The figures given are included in our statistics of pig-iron production.

| Years. | Net tons. | Years. | Net tons. |
|---|---|---|---|
| 1875 | 7,832 | 1880 | 19,603 |
| 1876 | 6,616 | 1881 | 21,086 |
| 1877 | 8,845 | 1882 | 21,963 |
| 1878 | 10,674 | 1883 | 24,574 |
| 1879 | 13,931 | | |

The product of 1883 was made by the New Jersey Zinc and Iron Company, the Cambria Iron Company, Carnegie Brothers & Co. Limited, the Lehigh Zinc and Iron Company, and the Colorado Coal and Iron Company. During 1883 the Passaic Zinc Company built a furnace, 40 feet by 10 feet, in Hudson county, New Jersey, for the production of spiegeleisen. It was put in blast on March 1, 1884. Every indication points to a material increase in our production of spiegeleisen in the early future. As in the past, both native and foreign ores will be used.

The following table gives the number of completed furnaces in the United States at the close of each of the twelve years from 1872 to 1883, allowance being made in each year for furnaces abandoned or torn down to make room for more modern structures.

| | | | | | |
|---|---|---|---|---|---|
| 1872 | 612 | 1876 | 712 | 1880 | 701 |
| 1873 | 657 | 1877 | 716 | 1881 | 716 |
| 1874 | 693 | 1878 | 692 | 1882 | 687 |
| 1875 | 713 | 1879 | 697 | 1883 | 683 |

During 1883 there were built in the United States 13 new furnaces—1 in New Jersey, already mentioned, 4 in Virginia, 1 in West Virginia, 1 in Texas, 5 in Alabama, and 1 in Tennessee. The last-named furnace, (Citico,) located at Chattanooga, was successfully blown in on the 4th of April last. During 1883 there were 17 furnaces either burned or abandoned—2 in New York, 6 in Pennsylvania, 7 in Ohio, 1 in Alabama, and 1 in Maryland.

At the close of 1882 there were 417 furnaces in blast and 270 out of blast, and at the close of 1883 there were 307 in blast and 376 out of blast. These figures show 110 fewer furnaces in blast at the close of 1883 than at the close of 1882. At first sight this great change would seem to indicate a greatly reduced capacity of production at the beginning of 1884, as compared with the beginning of 1883, but this would not be a correct conclusion, as few of our larg-

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est and best-appointed furnaces were blown out in 1883. Of the 110 furnaces that were in blast at the close of 1882 and out of blast at the close of 1883 a large majority were small and many were charcoal furnaces.

At the close of 1883 there were 19 blast furnaces in course of erection in the United States, as follows: Pennsylvania, 4 anthracite and 2 bituminous; Virginia, 2 bituminous; Alabama, 1 bituminous; Ohio, 3 bituminous; Michigan, 1 charcoal; North Carolina, 1 bituminous; Colorado, 3 bituminous; Utah Territory, 1 charcoal; Oregon, 1 charcoal. Since January 1st two of these furnaces have been completed and blown in. In addition to the above there was under construction at Croton Falls, New York, a furnace for the production of wrought iron and steel directly from the ore.

The following table shows in detail the number of furnaces in blast and out of blast at the close of 1882 and 1883 in each of the States and Territories. On April 1, 1884, the number of furnaces in blast had been slightly reduced as compared with January 1st.

| States and Territories. | December 31, 1882. | | | December 31, 1883. | | |
|---|---|---|---|---|---|---|
| | In blast. | Out of blast. | Total. | In blast. | Out of blast. | Total. |
| Maine | 1 | ..... | 1 | ..... | 1 | 1 |
| Vermont | ..... | 1 | 1 | ..... | 1 | 1 |
| Massachusetts | 2 | 3 | 5 | 3 | 2 | 5 |
| Connecticut | 7 | 2 | 9 | 4 | 5 | 9 |
| New York | 37 | 20 | 57 | 26 | 29 | 55 |
| New Jersey | 13 | 6 | 19 | 8 | 12 | 20 |
| Pennsylvania | 185 | 92 | 277 | 142 | 129 | 271 |
| Maryland | 11 | 12 | 23 | 8 | 14 | 22 |
| Virginia | 15 | 23 | 38 | 12 | 30 | 42 |
| North Carolina | ..... | 5 | 5 | ..... | 5 | 5 |
| Georgia | 4 | 2 | 6 | 3 | 3 | 6 |
| Alabama | 12 | 3 | 15 | 14 | 5 | 19 |
| West Virginia | 5 | 6 | 11 | 6 | 6 | 12 |
| Kentucky | 9 | 9 | 18 | 5 | 13 | 18 |
| Tennessee | 14 | 5 | 19 | 9 | 11 | 20 |
| Texas | 1 | ..... | 1 | 1 | 1 | 2 |
| Ohio | 62 | 35 | 97 | 39 | 51 | 90 |
| Indiana | 2 | 1 | 3 | 2 | 1 | 3 |
| Illinois | 9 | 7 | 16 | 4 | 12 | 16 |
| Missouri | 3 | 14 | 17 | 2 | 15 | 17 |
| Michigan | 14 | 15 | 29 | 12 | 16 | 28 |
| Wisconsin | 8 | 7 | 15 | 5 | 10 | 15 |
| Minnesota | 1 | ..... | 1 | ..... | 1 | 1 |
| Colorado | 1 | ..... | 1 | 1 | ..... | 1 |
| Utah Territory | ..... | 1 | 1 | ..... | 1 | 1 |
| Oregon | 1 | ..... | 1 | 1 | ..... | 1 |
| California | ..... | 1 | 1 | ..... | 1 | 1 |
| Washington Territory | ..... | ..... | ..... | ..... | 1 | 1 |
| Total | 417 | 270 | 687 | 307 | 376 | 683 |

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The following table shows the number of furnaces in blast and out of blast at the close of 1882 and 1883 in the pig-iron districts of Pennsylvania and Ohio.

| | Districts. | December 31, 1882. | | | December 31, 1883. | | |
|---|---|---|---|---|---|---|---|
| | | In blast. | Out of blast. | Total. | In blast. | Out of blast. | Total. |
| Pennsylvania. | Lehigh Valley | 44 | 7 | 51 | 29 | 22 | 51 |
| | Schuylkill Valley | 29 | 18 | 47 | 28 | 22 | 45 |
| | Upper Susquehanna | 14 | 11 | 25 | 13 | 12 | 25 |
| | Lower Susquehanna | 26 | 10 | 36 | 23 | 11 | 34 |
| | Shenango Valley | 12 | 17 | 29 | 12 | 17 | 29 |
| | Allegheny County | 11 | 5 | 16 | 11 | 5 | 16 |
| | Miscellaneous coke | 24 | 12 | 36 | 18 | 18 | 36 |
| | Charcoal | 25 | 12 | 37 | 13 | 22 | 35 |
| Ohio. | Hanging Rock coke | 10 | 4 | 14 | 8 | 6 | 14 |
| | Mahoning Valley | 13 | 5 | 18 | 8 | 10 | 18 |
| | Hocking Valley | 6 | 8 | 14 | 4 | 10 | 14 |
| | Miscellaneous coke | 14 | 6 | 20 | 8 | 12 | 20 |
| | Hanging Rock charcoal | 18 | 10 | 28 | 11 | 10 | 21 |
| | Miscellaneous charcoal | 1 | 2 | 3 | ..... | 3 | 3 |

The following table shows the number of furnaces in the United States in and out of blast at the close of 1883, as compared with the close of 1882, separated according to the fuel used.

| Kind of Fuel. | December 31, 1882. | | | December 31, 1883. | | |
|---|---|---|---|---|---|---|
| | In blast. | Out of blast. | Total. | In blast. | Out of blast. | Total. |
| Bituminous | 127 | 83 | 210 | 105 | 116 | 221 |
| Anthracite | 161 | 64 | 225 | 118 | 104 | 222 |
| Charcoal | 129 | 123 | 252 | 84 | 156 | 240 |
| Total | 417 | 270 | 687 | 307 | 376 | 683 |

The following table shows the quantity of each kind of pig iron held in stock by the furnace owners or their agents at the close of the last four years.

| Kind of Fuel. | Net tons. | | | |
|---|---|---|---|---|
| | Dec. 31, 1880. | Dec. 31, 1881. | Dec. 31, 1882. | Dec. 31, 1883. |
| Bituminous | 184,626 | 36,495 | 157,196 | 171,802 |
| Anthracite | 175,862 | 90,351 | 107,259 | 178,020 |
| Charcoal | 96,170 | 84,050 | 165,239 | 183,978 |
| Total | 456,658 | 210,896 | 429,694 | 533,800 |

The territorial distribution of all the stocks at the close of 1883 is given in the following table.

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| DISTRICTS. | Net tons of 2,000 pounds. | | | |
|---|---|---|---|---|
| | Anthracite. | Charcoal. | Bituminous. | Total. |
| New England, New York, and New Jersey... | 74,309 | 29,644 | ..... | 103,953 |
| Pennsylvania..... | 99,211 | 11,336 | 85,257 | 195,804 |
| Ohio..... | ..... | 25,221 | 47,915 | 73,136 |
| States south of Penna., Ohio, and Missouri.. | 4,500 | 52,541 | 34,153 | 91,194 |
| Western States..... | ..... | 65,236 | 4,477 | 69,713 |
| Total..... | 178,020 | 183,978 | 171,802 | 533,800 |

The consumption of pig iron in the United States in 1883 can be approximately determined. We produced 4,595,510 gross tons of pig iron, and imported 322,648 tons, to which must be added 383,655 tons of domestic pig iron and 14,802 tons of foreign pig iron held in stock at the beginning of 1883, giving a total supply of 5,316,615 tons. From this quantity must be deducted 476,607 gross tons of domestic pig iron and 5,268 tons of foreign pig iron held in stock at the close of 1883, or a total of 481,875 tons, leaving 4,834,740 tons as the probable consumption of 1883. In recent annual reports we have estimated in a similar manner the consumption of pig iron in 1881 at 4,982,565 gross tons, and the consumption of 1882 at 4,963,278 tons. We now find the probable consumption of 1883 to have been 4,834,740 tons. The coincidence in the estimated quantity of pig iron consumed in each of the last three years will not pass unnoticed.

## PRODUCTION OF IRON AND STEEL RAILS IN 1883.

The production of all kinds of rails in 1883 was as follows, in net tons, compared with the production of 1880, 1881, and 1882.

| KIND OF RAILS. | 1880. | 1881. | 1882. | 1883. |
|---|---|---|---|---|
| Iron rails..... | 493,762 | 488,581 | 227,874 | 64,954 |
| Bessemer steel rails..... | 954,460 | 1,330,302 | 1,438,155 | 1,286,554 |
| Open-hearth steel rails..... | 13,615 | 25,217 | 22,765 | 9,186 |
| Total ..... | 1,461,837 | 1,844,100 | 1,688,794 | 1,360,694 |

In the following table we give the total rail production of the country in the last five years, in both net and gross tons.

| | 1879. | 1880. | 1881. | 1882. | 1883. |
|---|---|---|---|---|---|
| Net tons..... | 1,113,273 | 1,461,837 | 1,844,100 | 1,688,794 | 1,360,694 |
| Gross tons..... | 993,993 | 1,305,212 | 1,646,518 | 1,507,851 | 1,214,905 |

The year 1881 was the year of largest production of rails of all kinds in the history of the country, aggregating 1,844,100 net tons, or 1,646,518 gross tons. In 1882 there was a decrease of 155,306

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net tons, or about 8 per cent. In 1883 there was a decrease upon the production of 1882 of 328,100 net tons, or nearly 20 per cent. The decrease in 1883 upon the production of 1881 amounted to 483,406 net tons, or over 26 per cent.

No special significance attaches to the decreased production of open-hearth steel rails in the last two years, as open-hearth steel will never be a competitor with Bessemer steel in the manufacture of rails. The very great decline in the production of iron rails in recent years is, however, indicative of the almost total destruction of this branch of our iron industry. That only 64,954 net tons, or 57,995 gross tons, of iron rails should have been produced in 1883 is a result that was scarcely to have been looked for at so early a period after the rail scarcity of 1879 and 1880. The cheaper price at which Bessemer steel rails can be produced has, however, suddenly sealed the fate of iron rails.

Included in the production of Bessemer steel rails in 1883 were 32,629 net tons which were rolled in iron rolling mills, chiefly from imported blooms. The remainder of the year's product (1,253,925 net tons) was rolled directly by the producers of Bessemer ingots. In 1882 there were rolled in iron rolling mills 103,806 net tons of Bessemer steel rails, chiefly from imported blooms.

The production of iron and steel rails in this country since the beginning of the manufacture of Bessemer steel rails in 1867 has been as follows, in net tons.

| YEARS. | Net tons of 2,000 pounds. | | | | |
|---|---|---|---|---|---|
| | Iron rails, all kinds. | Bessemer steel rails. | Open-hearth steel rails. | Total steel rails. | Total iron and steel rails. |
| 1867 | 459,558 | 2,550 | ..... | 2,550 | 462,108 |
| 1868 | 499,489 | 7,225 | ..... | 7,225 | 506,714 |
| 1869 | 583,936 | 9,650 | ..... | 9,650 | 593,586 |
| 1870 | 586,000 | 34,000 | ..... | 34,000 | 620,000 |
| 1871 | 737,483 | 38,250 | ..... | 38,250 | 775,733 |
| 1872 | 905,930 | 94,070 | ..... | 94,070 | 1,000,000 |
| 1873 | 761,062 | 129,015 | ..... | 129,015 | 890,077 |
| 1874 | 584,469 | 144,944 | ..... | 144,944 | 729,413 |
| 1875 | 501,649 | 290,863 | ..... | 290,863 | 792,512 |
| 1876 | 467,168 | 412,461 | ..... | 412,461 | 879,629 |
| 1877 | 332,540 | 432,169 | ..... | 432,169 | 764,709 |
| 1878 | 322,890 | 550,398 | 9,397 | 559,795 | 882,685 |
| 1879 | 420,160 | 683,964 | 9,149 | 693,113 | 1,113,273 |
| 1880 | 498,762 | 954,460 | 13,615 | 968,075 | 1,461,837 |
| 1881 | 488,581 | 1,330,302 | 25,217 | 1,355,519 | 1,844,100 |
| 1882 | 227,874 | 1,438,155 | 22,765 | 1,460,920 | 1,688,794 |
| 1883 | 64,954 | 1,286,554 | 9,186 | 1,295,740 | 1,360,694 |

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The production of street rails in 1883 (included in the total production of rails) was 19,440 net tons, a decrease of 2,846 tons upon the production of 1882, which was 22,286 tons. The production in 1883 consisted of 1,970 tons of iron rails, 14,499 tons of Bessemer steel rails, and 2,971 tons of open-hearth steel rails.

The production of rails of all kinds in the United States from 1849 to 1883 has been as follows, in net tons.

| Years. | Net tons. | Years. | Net tons. | Years. | Net tons. | Years. | Net tons. |
|---|---|---|---|---|---|---|---|
| 1849..... | 24,318 | 1858..... | 163,712 | 1867..... | 462,108 | 1876..... | 879,629 |
| 1850..... | 44,083 | 1859..... | 195,454 | 1868..... | 506,714 | 1877..... | 764,709 |
| 1851..... | 50,603 | 1860..... | 205,038 | 1869..... | 593,586 | 1878..... | 882,685 |
| 1852..... | 62,478 | 1861..... | 189,818 | 1870..... | 620,000 | 1879..... | 1,113,273 |
| 1859..... | 87,864 | 1862..... | 213,912 | 1871..... | 775,733 | 1880..... | 1,461,837 |
| 1854..... | 108,016 | 1863..... | 275,768 | 1872..... | 1,000,000 | 1881..... | 1,844,100 |
| 1855..... | 138,674 | 1864..... | 335,369 | 1873..... | 890,077 | 1882..... | 1,688,794 |
| 1856..... | 180,018 | 1865..... | 356,292 | 1874..... | 729,413 | 1883..... | 1,360,694 |
| 1857..... | 161,918 | 1866..... | 430,778 | 1875..... | 792,512 | ..... | ..... |

The following table shows the production of rails of all kinds in 1883 by States in the order of their prominence.

| States. | Net tons. | States. | Net tons. |
|---|---|---|---|
| Pennsylvania..... | 857,818 | Wyoming Territory..... | 6,845 |
| Illinois..... | 232,005 | Tennessee..... | 2,650 |
| New York..... | 76,020 | Wisconsin..... | 1,259 |
| Missouri..... | 64,142 | West Virginia..... | 775 |
| Ohio..... | 62,518 | Alabama..... | 680 |
| Colorado..... | 19,688 | New Jersey..... | 60 |
| Indiana..... | 16,309 | | |
| Massachusetts..... | 12,465 | Total..... | 1,360,694 |
| California..... | 7,460 | | |

Pennsylvania's share of the total production of 1883 was 63 per cent.; Illinois made 17 per cent.

The production of iron rails in 1883 was distributed as follows:

| States. | Net tons. | States. | Net tons. |
|---|---|---|---|
| Pennsylvania..... | 29,963 | West Virginia..... | 775 |
| Indiana..... | 16,297 | Alabama..... | 680 |
| Wyoming Territory..... | 6,845 | Illinois..... | 650 |
| California..... | 2,910 | New Jersey..... | 60 |
| Ohio..... | 2,243 | Missouri..... | 23 |
| Tennessee..... | 2,050 | | |
| Wisconsin..... | 1,249 | Total..... | 64,954 |
| Colorado..... | 1,209 | | |

The production of Bessemer steel rails from 1874 to 1883 was territorially distributed as follows:

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| YEARS. | Net tons of 2,000 pounds. | | | |
|---|---|---|---|---|
| | Pennsylvania. | Illinois. | Other States. | Total. |
| 1874 | 66,902 | 48,280 | 29,762 | 144,944 |
| 1875 | 112,843 | 111,189 | 66,831 | 290,863 |
| 1876 | 208,750 | 133,713 | 74,998 | 412,461 |
| 1877 | 250,531 | 89,519 | 92,119 | 432,169 |
| 1878 | 308,093 | 143,785 | 98,520 | 550,398 |
| 1879 | 368,187 | 197,881 | 117,896 | 683,964 |
| 1880 | 495,716 | 257,583 | 201,161 | 954,460 |
| 1881 | 688,276 | 346,272 | 295,754 | 1,330,302 |
| 1882 | 759,524 | 336,122 | 342,509 | 1,438,155 |
| 1883 | 819,544 | 231,355 | 235,655 | 1,286,554 |

The following table will show approximately the consumption of all kinds of rails in this country from 1867 to 1883, in net tons.

| YEARS. | Made in United States. | Imported. | | Approximate consumption. |
|---|---|---|---|---|
| | | Iron. | Steel. | |
| 1867 | 462,108 | 163,049 | | 625,157 |
| 1868 | 506,714 | 250,081 | | 756,795 |
| 1869 | 593,586 | 313,163 | | 906,749 |
| 1870 | 620,000 | 399,153 | | 1,019,153 |
| 1871 | 775,733 | 566,202 | | 1,341,935 |
| 1872 | 1,000,000 | 381,064 | 149,786 | 1,530,850 |
| 1873 | 890,077 | 99,201 | 159,571 | 1,148,849 |
| 1874 | 729,413 | 7,796 | 100,515 | 837,724 |
| 1875 | 792,512 | 1,174 | 18,274 | 811,960 |
| 1876 | 879,629 | 287 | None | 879,916 |
| 1877 | 764,709 | None | 35 | 764,744 |
| 1878 | 882,685 | None | 10 | 882,695 |
| 1879 | 1,113,273 | 19,090 | 25,057 | 1,157,420 |
| 1880 | 1,461,837 | 132,459 | 158,230 | 1,752,526 |
| 1881 | 1,844,100 | 137,013 | 249,308 | 2,230,421 |
| 1882 | 1,688,794 | 41,992 | 182,135 | 1,912,921 |
| 1883 | 1,360,694 | 757 | 38,220 | 1,399,671 |

The figures given do not necessarily imply that all the rails made at home or imported from year to year have been actually laid down as promptly as they were provided, but they mean simply that the rails in the table have been manufactured and sold in the years specified, and hence have gone into consumption.

In the following table we give the statistics of the annual production of Bessemer steel rails in the United States since the commencement of their manufacture, together with the average annual price at which they have been sold and the rates of duty imposed on foreign rails. The yearly price has been obtained by averaging the monthly prices. No better proof of the wisdom of our Protective policy is needed than is furnished by this table.

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| YEARS. | Product in Gross Tons. | Price in Currency. | Duty. |
|---|---|---|---|
| 1867 | 2,277 | $166.00 | 45 per cent. *ad valorem.* |
| 1868 | 6,451 | 158.50 | |
| 1869 | 8,616 | 132.25 | |
| 1870 | 30,357 | 106.75 | |
| 1871 | 34,152 | 102.50 | $28 per ton to Aug. 1, 1872; $25.20 to Mar. 3, 1875; $28 from that date to July 1, 1883. From July 1, 1883, $17. |
| 1872 | 83,991 | 112.00 | |
| 1873 | 115,192 | 120.50 | |
| 1874 | 129,414 | 94.25 | |
| 1875 | 259,699 | 68.75 | |
| 1876 | 368,269 | 59.25 | |
| 1877 | 385,865 | 45.50 | |
| 1878 | 491,427 | 42.25 | |
| 1879 | 610,682 | 48.25 | |
| 1880 | 852,196 | 67.50 | |
| 1881 | 1,187,770 | 61.13 | |
| 1882 | 1,284,067 | 48.50 | |
| 1883 | 1,148,709 | 37.75 | |
| 1884 (April) | ..... | 34.00 | |

## PRODUCTION OF BESSEMER STEEL IN 1883.

The production of Bessemer steel in the United States reached its highest point in 1882, when 1,696,450 net tons of ingots were produced. In 1883 the production amounted to 1,654,627 net tons, or 41,823 tons less than in 1882. This was the first decrease that has occurred in our Bessemer steel history. Fifteen Bessemer works were in operation in 1883—one (Union) for only a few weeks in the early part of the year. These fifteen works embraced in all 38 converters, but four of these converters were in use only a small part of the year. Two of these were connected with the Union works, and two were used by the Pennsylvania Steel Company in experimenting in the production of Bessemer steel by the basic process. The first blow of basic steel in this country took place at the works of this company on May 7, 1883, and the results were in all respects satisfactory. The company is encouraged to begin the manufacture of this kind of steel as a commercial product at an early day. No other company in the United States has yet engaged in the manufacture of basic steel.

The works of the Scranton Steel Company, at Scranton, Pennsylvania, made an experimental blow on the 29th of March, 1883, and rolled their first steel rail on May 4, 1883.

In addition to the fifteen completed Bessemer steel works in the United States in 1883, there were in course of erection on the 1st of April last four new works—one in Massachusetts for the production

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of steel for the manufacture of light and heavy rails, and two in West Virginia and one in Ohio for the production of steel for the manufacture of steel-nail plates. Each of these new works will have two converters. A comprehensive exhibit of the nineteen Bessemer steel works of the country which were completed in 1883 or were in course of erection on the 1st of April last is as follows:

| Names of Companies. | Converters. | |
|---|---|---|
| | Completed. | Building. |
| Albany and Rensselaer Iron and Steel Company, Troy, N. Y. | two 8-ton | ..... |
| Bethlehem Iron Company, Bethlehem, Pennsylvania | four 7-ton | ..... |
| Pennsylvania Steel Company, Steelton, Pennsylvania | two 7-ton<br>three 8-ton | ..... |
| Lackawanna Iron and Coal Company, Scranton, Pa | two 7-ton | ..... |
| Scranton Steel Company, Scranton, Pennsylvania | two 4-ton | ..... |
| Cambria Iron Company, Johnstown, Pennsylvania | two 7-ton | ..... |
| Carnegie Bros. & Co. Limited, Bessemer, Pennsylvania | three 10-ton | ..... |
| Pittsburgh Bessemer Steel Company Lim., Homestead, Pa. | two 4-ton | ..... |
| Pittsburgh Steel Casting Company, Pittsburgh, Pennsylvania | one 6-ton | ..... |
| Cleveland Rolling Mill Company, Cleveland, Ohio | two 7-ton | ..... |
| North Chicago Rolling Mill Company, Chicago (2 plants) | two 7-ton<br>three 10-ton | ..... |
| Union Iron and Steel Company, Chicago, Illinois | two 6-ton | ..... |
| Joliet Steel Company, Joliet, Illinois | two 5-ton | ..... |
| St. Louis Ore and Steel Company, St. Louis, Missouri | two 7-ton | ..... |
| Colorado Coal and Iron Company, South Pueblo, Colorado | two 5-ton | ..... |
| Washburn Iron Company, Worcester, Mass | ..... | two 4-ton |
| Riverside Iron Works, Wheeling, W. Va | ..... | two 5-ton |
| Benwood Iron Works, Benwood, W. Va | ..... | two 4-ton |
| Bellaire Nail Works, Bellaire, Ohio | ..... | two 4-ton |
| Total number of converters | 38 | 8 |

Of the four new Bessemer plants above mentioned as in course of erection on the 1st of April last the works at Bellaire have since been completed, but at the time this report goes to press they have not been put in operation. A letter from the company, dated April 18th, says that they would be put in operation before May 1st.

In addition to the above, Messrs. Oliver Brothers & Phillips, of Pittsburgh, have just completed the erection of a small steel-making plant in that city, embracing one stationary converter, to be operated upon the pneumatic principle.

The production of Bessemer steel ingots in this country in the twelve years from 1872 to 1883 has been as follows, in net tons.

| Years. | Net tons. | Years. | Net tons. | Years. | Net tons. |
|---|---|---|---|---|---|
| 1872 | 120,108 | 1876 | 525,996 | 1880 | 1,203,173 |
| 1873 | 170,652 | 1877 | 560,587 | 1881 | 1,539,157 |
| 1874 | 191,933 | 1878 | 732,226 | 1882 | 1,696,450 |
| 1875 | 375,517 | 1879 | 928,972 | 1883 | 1,654,627 |

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The production of Bessemer steel ingots in this country from 1874 to 1883 by States has been as follows, in net tons.

| YEARS. | Net tons of 2,000 pounds. | | | |
|---|---|---|---|---|
| | Pennsylvania. | Illinois. | Other States. | Total. |
| 1874 | 85,625 | 62,492 | 43,816 | 191,933 |
| 1875 | 148,374 | 136,356 | 90,787 | 375,517 |
| 1876 | 258,452 | 171,963 | 95,581 | 525,996 |
| 1877 | 328,599 | 111,299 | 120,689 | 560,587 |
| 1878 | 426,481 | 179,500 | 126,245 | 732,226 |
| 1879 | 514,165 | 250,980 | 163,827 | 928,972 |
| 1880 | 643,894 | 304,614 | 254,665 | 1,203,173 |
| 1881 | 844,501 | 375,763 | 318,893 | 1,539,157 |
| 1882 | 933,631 | 397,436 | 365,383 | 1,696,450 |
| 1883 | 1,044,396 | 273,325 | 336,906 | 1,654,627 |

As has been already remarked, there was a decrease in the production of Bessemer steel ingots in 1883 of only 41,823 net tons as compared with the production of 1882, or from 1,696,450 tons to 1,654,627 tons. The quantity of these ingots which passes into forms other than rails is much larger than has been generally supposed. By reference to the statistics of iron and steel rails, already given, it will be seen that in 1882 we produced in the Bessemer works of the country, not counting the Bessemer steel rails produced in iron rolling mills, 1,334,349 net tons of Bessemer steel rails, and that in 1883 we produced in like manner 1,253,925 tons. Very few of the rails rolled in iron rolling mills in either year were from American blooms, and they need not be considered in this connection. In reducing ingots to finished forms an allowance of about 12½ per cent. must be made for loss in oxidation and for such crop ends as must be re-converted. Tabulating the figures above given we have the following results.

| PRODUCTS. | Net tons. | | |
|---|---|---|---|
| | 1882. | 1883. | Decrease. |
| Bessemer steel ingots | 1,696,450 | 1,654,627 | 41,823 |
| Less about 12½ per cent. oxidation and crop ends to be re-converted | 212,056 | 206,828 | 5,228 |
| Bessemer steel in finished forms | 1,484,394 | 1,447,799 | 36,595 |
| Bessemer steel rails produced | 1,334,349 | 1,253,925 | 80,424 |
| Bessemer steel in other finished forms | 150,045 | 193,874 | Increase, 43,829 |

Assuming that practically the same quantity of ingots is carried over at the various Bessemer steel works from year to year, it will be seen at a glance that a large proportion of our ingot tonnage

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goes into forms other than rails, and that this use of Bessemer steel increased in 1883 as compared with 1882. In 1882 over 10 per cent. of the finished product appears to have been in miscellaneous forms, and in 1883 over 13 per cent. appears to have been in these forms. These miscellaneous forms now conspicuously embrace steel for bridges and structural purposes generally, car and locomotive springs, angles and other shapes for shipbuilding, agricultural implements and machinery, plates and sheets, wire rods, and nails.

Nearly all our barbed wire is made of Bessemer steel wire rods, some of which are, however, imported. The production of barbed wire in this country, which is wholly used for fencing purposes, is said to have amounted in 1873 to only sixty tons, but in 1883 it amounted to about 100,000 tons. It is probable that the production in 1884 will not be much, if any, greater than in 1883.

## PRODUCTION OF CRUCIBLE, OPEN-HEARTH, BLISTER, AND MISCELLANEOUS STEEL IN 1883.

The production of crucible steel ingots in the United States reached its highest point in 1881, when 89,762 net tons were produced. There was a decrease from these figures in 1882, and a still further decrease in 1883. The production in 1883 was 80,455 net tons, a decrease of 4,634 tons upon the production of 85,089 tons in 1882. The decrease in 1882 as compared with 1881 was 4,673 tons. Six States made crucible steel in 1883, namely, Massachusetts, Connecticut, New York, New Jersey, Pennsylvania, and Ohio.

The following table gives the production of crucible steel ingots in various sections of the country from 1875 to 1883, in net tons.

| STATES. | 1875. | 1876. | 1877. | 1878. | 1879. | 1880. | 1881. | 1882. | 1883. |
|---|---|---|---|---|---|---|---|---|---|
| New England | 1,620 | 1,098 | 1,974 | 1,602 | 1,608 | 660 | 2,780 | 1,000 | 2,373 |
| New York | 2,300 | 2,300 | 2,032 | 2,800 | 2,300 | 3,500 | 4,961 | 4,693 | 2,976 |
| New Jersey | 7,098 | 6,806 | 6,749 | 7,377 | 8,651 | 10,387 | 14,500 | 12,400 | 10,539 |
| Pennsylvania | 26,615 | 28,217 | 27,983 | 30,585 | 43,614 | 57,077 | 66,290 | 65,139 | 63,687 |
| Western States | 1,500 | 700 | 1,400 | 480 | 605 | 800 | 1,231 | 1,857 | 880 |
| Southern States | 268 | 261 | 292 | 62 | 2 | ..... | ..... | ..... | ..... |
| Total | 39,401 | 39,382 | 40,430 | 42,906 | 56,780 | 72,424 | 89,762 | 85,089 | 80,455 |

Included in the 80,455 tons of crucible steel ingots produced in 1883 are 1,000 tons of castings made directly from the crucibles.

The production of open-hearth steel ingots in the United States in 1883 was 133,679 net tons, a decrease of 26,863 tons upon the production of 160,542 tons in 1882, which is the highest that has yet been attained. This is the first decrease in production that has

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occurred in the open-hearth steel industry of this country. The product of 1883 was made in eight States, namely, New Hampshire, Massachusetts, New York, New Jersey, Pennsylvania, Ohio, Tennessee, and Illinois.

The following table gives the production of open-hearth steel ingots in the United States by districts from 1875 to 1883, in net tons.

| States. | 1875. | 1876. | 1877. | 1878. | 1879. | 1880. | 1881. | 1882. | 1883. |
|---|---|---|---|---|---|---|---|---|---|
| New York and New England | 3,010 | 6,085 | 6,652 | 8,228 | 14,660 | 20,560 | 24,600 | 25,536 | 17,904 |
| New Jersey and Pennsylvania. | 4,240 | 7,547 | 7,771 | 12,231 | 19,575 | 50,736 | 68,363 | 73,222 | 72,333 |
| Western and Southern..... | 1,800 | 7,858 | 10,608 | 15,667 | 22,055 | 41,657 | 53,983 | 61,784 | 43,442 |
| Total..... | 9,050 | 21,490 | 25,031 | 36,126 | 56,290 | 112,953 | 146,946 | 160,542 | 133,679 |

Included in the production of open-hearth steel ingots in 1883 are 1,684 net tons of steel castings made directly from the open-hearth furnace. The production of steel castings is rapidly increasing in this country.

The following table gives the production of blister, puddled, and patented steel in the United States from 1875 to 1883, in net tons. The product of 1883 was made in four States, namely, New York, Massachusetts, Pennsylvania, and Ohio.

| States. | 1875. | 1876. | 1877. | 1878. | 1879. | 1880. | 1881. | 1882. | 1883. |
|---|---|---|---|---|---|---|---|---|---|
| New England..... | 1,500 | ..... | ..... | 192 | 950 | 72 | 200 | ..... | 713 |
| New York..... | ..... | 139 | ..... | 220 | 215 | 617 | ..... | ..... | 1,105 |
| New Jersey..... | 100 | 652 | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| Pennsylvania..... | 7,340 | 7,601 | 9,870 | 8,069 | 3,004 | 6,658 | 2,113 | 2,114 | 2,558 |
| Western States... | ..... | 1,700 | 2,034 | 75 | 1,000 | 1,018 | 734 | 900 | 1,222 |
| Southern States.. | 3,667 | 214 | 20 | ..... | 295 | 100 | ..... | ..... | ..... |
| Total..... | 12,607 | 10,306 | 11,924 | 8,556 | 5,464 | 8,465 | 3,047 | 3,014 | 5,598 |

The following table gives the production in the United States of crucible steel ingots, blister steel, and puddled and patented steel, from 1865 to 1883, in net tons.

| Years. | Net tons. | Years. | Net tons. | Years. | Net tons. |
|---|---|---|---|---|---|
| 1865..... | 15,262 | 1872..... | 37,000 | 1879..... | 62,244 |
| 1866..... | 18,973 | 1873..... | 48,500 | 1880..... | 80,889 |
| 1867..... | 19,000 | 1874..... | 42,681 | 1881..... | 92,809 |
| 1868..... | 21,500 | 1875..... | 52,008 | 1882..... | 88,103 |
| 1869..... | 23,000 | 1876..... | 49,688 | 1883..... | 86,053 |
| 1870..... | 35,000 | 1877..... | 52,354 | | |
| 1871..... | 37,000 | 1878..... | 51,462 | | |

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## PRODUCTION OF ALL KINDS OF STEEL FROM 1872 TO 1883.

The following table gives the production in the United States of all kinds of steel in the twelve years from 1872 to 1883, in net tons. This is another table that may well excite the pride of our people.

| Years. | Net tons of 2,000 pounds. | | | | |
|---|---|---|---|---|---|
| | Bessemer steel ingots. | Crucible steel ingots. | Open-hearth steel ingots. | All other steel. | Total. |
| 1872..... | 120,108 | 29,260 | 3,000 | 7,740 | 160,108 |
| 1873..... | 170,652 | 34,786 | 3,500 | 13,714 | 222,652 |
| 1874..... | 191,933 | 36,328 | 7,000 | 6,353 | 241,614 |
| 1875..... | 375,517 | 39,401 | 9,050 | 12,607 | 436,575 |
| 1876..... | 525,996 | 39,382 | 21,490 | 10,306 | 597,174 |
| 1877..... | 560,587 | 40,430 | 25,031 | 11,924 | 637,972 |
| 1878..... | 732,226 | 42,906 | 36,126 | 8,556 | 819,814 |
| 1879..... | 928,972 | 56,780 | 56,290 | 5,464 | 1,047,506 |
| 1880..... | 1,203,173 | 72,424 | 112,953 | 8,465 | 1,397,015 |
| 1881..... | 1,539,157 | 89,762 | 146,946 | 3,047 | 1,778,912 |
| 1882..... | 1,696,450 | 85,089 | 160,542 | 3,014 | 1,945,095 |
| 1883..... | 1,654,627 | 80,455 | 133,679 | 5,598 | 1,874,359 |

## THE GROWTH OF OUR PIG IRON INDUSTRY BY DECADES.

The following table shows the growth of the pig iron industry of the United States from 1810, in gross tons.

| Years. | Gross tons. | Years. | Gross tons. | Years. | Gross tons. |
|---|---|---|---|---|---|
| 1810..... | 54,000 | 1840..... | 315,000 | 1870..... | 1,665,179 |
| 1820..... | 20,000 | 1850..... | 564,755 | 1880..... | 3,835,191 |
| 1830..... | 165,000 | 1860..... | 821,223 | 1883..... | 4,595,510 |

## PRODUCTION OF BARS, SHAPES, PLATES, SHEETS, AND OTHER ROLLED IRON IN 1883.

By the term rolled iron we include (1) cut nails and spikes; (2) bar, shaped, bolt, rod, skelp, and hoop iron, and rolled axles; (3) plate and sheet iron; and (4) all sizes of iron rails.

Omitting iron rails, our production of rolled iron in 1882 was 2,265,957 net tons, against 2,155,346 tons in 1881, an increase of 110,611 tons. In 1883, still omitting iron rails, our production of rolled iron was 2,283,920 tons, an increase of 17,963 tons over the production of 1882. This increase was more than covered by the extraordinary increase in the production of nail plate for cut nails and spikes. In 1882 the production of nail plate was 307,355 net tons, and in 1883 it was 388,136 tons, an increase of 80,781 tons.

In the following table we give detailed statistics of the production of the different forms of rolled iron in 1883, in net tons.

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| States. | Bar, rod, bolt, hoop, skelp, and shaped iron. Net tons. | Plate and sheet iron, except nail plate. Net tons. | Cut nails. | | Iron rails. Net tons. | Total. Net tons. |
|---|---|---|---|---|---|---|
| | | | Kegs. | Net tons. | | |
| Maine | 8,947 | 1,350 | 7,306 | 365 | ..... | 10,662 |
| New Hampshire | 2,132 | 26 | ..... | ..... | ..... | 2,158 |
| Massachusetts | 47,915 | 18,626 | 677,540 | 33,877 | ..... | 100,418 |
| Rhode Island | 14,405 | ..... | ..... | ..... | ..... | 14,405 |
| Connecticut | 18,491 | 50 | ..... | ..... | ..... | 18,541 |
| New York | 104,229 | 677 | 14,768 | 738 | ..... | 105,644 |
| New Jersey | 56,839 | 2,305 | 338,107 | 16,905 | 60 | 76,109 |
| Pennsylvania | 675,226 | 254,446 | 2,430,552 | 121,528 | 29,963 | 1,081,163 |
| Delaware | 22,755 | 12,629 | ..... | ..... | ..... | 35,384 |
| Maryland | 17,459 | 11,491 | ..... | ..... | ..... | 28,950 |
| District of Columbia | 141 | 8 | ..... | ..... | ..... | 149 |
| Virginia | 22,687 | ..... | 161,279 | 8,064 | ..... | 30,751 |
| Alabama | 6,656 | ..... | 20,000 | 1,000 | 680 | 8,336 |
| West Virginia | 4,964 | 7,781 | 1,327,484 | 66,374 | 775 | 79,894 |
| Kentucky | 36,531 | 14,498 | 144,686 | 7,234 | ..... | 58,263 |
| Tennessee | 9,786 | ..... | 212,358 | 10,618 | 2,050 | 22,454 |
| Ohio | 263,247 | 49,987 | 1,249,700 | 62,485 | 2,243 | 377,962 |
| Indiana | 18,921 | ..... | 413,380 | 20,669 | 16,297 | 55,887 |
| Illinois | 94,747 | ..... | 526,108 | 26,305 | 650 | 121,702 |
| Missouri | 9,642 | 6,168 | ..... | ..... | 23 | 15,833 |
| Michigan | 8,080 | 3,820 | ..... | ..... | ..... | 11,900 |
| Wisconsin | 38,946 | ..... | ..... | ..... | 1,249 | 40,195 |
| Nebraska | ..... | ..... | 65,000 | 3,250 | ..... | 3,250 |
| Colorado | 3,486 | ..... | 62,969 | 3,149 | 1,209 | 7,844 |
| Wyoming Ty | 4,443 | ..... | ..... | ..... | 6,845 | 11,288 |
| California | 20,747 | 500 | 111,500 | 5,575 | 2,910 | 29,732 |
| Total | 1,511,422 | 384,362 | 7,762,737 | 388,136 | 64,954 | 2,348,874 |

To better show the relative prominence of the different States in the production of rolled iron in 1883 we give below another table showing the aggregate production of all rolled iron in that year. Comparative figures for recent years will be found in later tables.

| States. | Net tons. | States. | Net tons. |
|---|---|---|---|
| Pennsylvania | 1,081,163 | Tennessee | 22,454 |
| Ohio | 377,962 | Connecticut | 18,541 |
| Illinois | 121,702 | Missouri | 15,833 |
| New York | 105,644 | Rhode Island | 14,405 |
| Massachusetts | 100,418 | Michigan | 11,900 |
| West Virginia | 79,894 | Wyoming Ty | 11,288 |
| New Jersey | 76,109 | Maine | 10,662 |
| Kentucky | 58,263 | Alabama | 8,336 |
| Indiana | 55,887 | Colorado | 7,844 |
| Wisconsin | 40,195 | Nebraska | 3,250 |
| Delaware | 35,384 | New Hampshire | 2,158 |
| Virginia | 30,751 | District of Columbia | 149 |
| California | 29,732 | | |
| Maryland | 28,950 | Total | 2,348,874 |

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The production of bar, rod, bolt, skelp, hoop, and shaped iron, and rolled axles in the United States in 1883 was as follows:

| States. | Net tons. | States. | Net tons. |
|---|---|---|---|
| Pennsylvania | 675,226 | Rhode Island | 14,405 |
| Ohio | 263,247 | Tennessee | 9,786 |
| New York | 104,229 | Missouri | 9,642 |
| Illinois | 94,747 | Maine | 8,947 |
| New Jersey | 56,839 | Michigan | 8,080 |
| Massachusetts | 47,915 | Alabama | 6,656 |
| Wisconsin | 38,946 | West Virginia | 4,964 |
| Kentucky | 36,531 | Wyoming Ty | 4,443 |
| Delaware | 22,755 | Colorado | 3,486 |
| Virginia | 22,687 | New Hampshire | 2,132 |
| California | 20,747 | District of Columbia | 141 |
| Indiana | 18,921 | | |
| Connecticut | 18,491 | Total | 1,511,422 |
| Maryland | 17,459 | | |

The production of plate and sheet iron, except nail plate, in the United States in 1883 was as follows:

| States. | Net tons. | States. | Net tons. |
|---|---|---|---|
| Pennsylvania | 254,446 | New Jersey | 2,305 |
| Ohio | 49,987 | Maine | 1,350 |
| Massachusetts | 18,626 | New York | 677 |
| Kentucky | 14,498 | California | 500 |
| Delaware | 12,629 | Connecticut | 50 |
| Maryland | 11,491 | New Hampshire | 26 |
| West Virginia | 7,781 | District of Columbia | 8 |
| Missouri | 6,168 | | |
| Michigan | 3,820 | Total | 384,362 |

The production of cut nails and spikes from nail plate in the United States in 1883 was as follows, in kegs of 100 pounds.

| States. | Kegs of 100 pounds. | States. | Kegs of 100 pounds. |
|---|---|---|---|
| Pennsylvania | 2,430,552 | Kentucky | 144,686 |
| West Virginia | 1,327,484 | California | 111,500 |
| Ohio | 1,249,700 | Nebraska | 65,000 |
| Massachusetts | 677,540 | Colorado | 62,969 |
| Illinois | 526,108 | Alabama | 20,000 |
| Indiana | 413,380 | New York | 14,768 |
| New Jersey | 338,107 | Maine | 7,306 |
| Tennessee | 212,358 | | |
| Virginia | 161,279 | Total | 7,762,737 |

The production of cut nails and spikes in each of the last twelve years is given in the following table, in kegs. In 1883 we produced nearly 55 per cent. more kegs than in 1879.

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| Years. | Kegs. | Years. | Kegs. | Years. | Kegs. | Years. | Kegs. |
|---|---|---|---|---|---|---|---|
| 1872 | 4,065,322 | 1875 | 4,726,881 | 1878 | 4,396,180 | 1881 | 5,794,206 |
| 1873 | 4,024,704 | 1876 | 4,157,814 | 1879 | 5,011,021 | 1882 | 6,147,097 |
| 1874 | 4,912,180 | 1877 | 4,828,918 | 1880 | 5,870,512 | 1883 | 7,762,737 |

The most prominent nail-manufacturing district in the United States is the Wheeling district, which includes the nail factories in West Virginia and in that part of Ohio which lies near Wheeling. The following table shows the production of this district in the last four years, as compared with the production of the United States.

| Districts. | Kegs of 100 pounds. | | | |
|---|---|---|---|---|
| | 1880. | 1881. | 1882. | 1883. |
| West Virginia | 1,025,155 | 1,241,102 | 1,023,711 | 1,327,484 |
| Part of Ohio | 445,248 | 461,020 | 474,435 | 874,926 |
| Total Wheeling district | 1,470,403 | 1,702,122 | 1,498,146 | 2,202,410 |
| Total United States | 5,370,512 | 5,794,206 | 6,147,097 | 7,762,737 |

The following table gives the production of all kinds of rolled iron in the United States from 1864 to 1883, in net tons. Tables like this should be printed in large type and exhibited to the voters of the country as proofs of the wisdom of our Protective policy.

| Years. | Net tons of 2,000 pounds. | | |
|---|---|---|---|
| | Iron rails. | Other rolled iron. | Total. |
| 1864 | 335,369 | 536,958 | 872,327 |
| 1865 | 356,292 | 500,048 | 856,340 |
| 1866 | 430,778 | 595,311 | 1,026,089 |
| 1867 | 459,558 | 579,838 | 1,039,396 |
| 1868 | 499,489 | 598,286 | 1,097,775 |
| 1869 | 583,936 | 642,420 | 1,226,356 |
| 1870 | 586,000 | 705,000 | 1,291,000 |
| 1871 | 737,483 | 710,000 | 1,447,483 |
| 1872 | 905,930 | 941,992 | 1,847,922 |
| 1873 | 761,062 | 1,076,368 | 1,837,430 |
| 1874 | 584,469 | 1,110,147 | 1,694,616 |
| 1875 | 501,649 | 1,097,867 | 1,599,516 |
| 1876 | 467,168 | 1,042,101 | 1,509,269 |
| 1877 | 332,540 | 1,144,219 | 1,476,759 |
| 1878 | 322,890 | 1,232,686 | 1,555,576 |
| 1879 | 420,160 | 1,627,324 | 2,047,484 |
| 1880 | 493,762 | 1,838,906 | 2,332,668 |
| 1881 | 488,581 | 2,155,346 | 2,643,927 |
| 1882 | 227,874 | 2,265,957 | 2,493,831 |
| 1883 | 64,954 | 2,283,920 | 2,348,874 |

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## PRODUCTS OF FORGES AND BLOOMARIES IN 1883.

As we have heretofore explained, blooms and billets from ore are made chiefly in the Champlain district of New York, and blooms from pig and scrap iron are made chiefly in Pennsylvania. The former are used for conversion into plate and sheet iron, iron wire, and open-hearth and crucible steel; the latter almost wholly for conversion into plates and sheets. The make of each of these products in the last ten years is given below, in net tons.

| PRODUCTS. | Net tons of 2,000 pounds. | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | 1874. | 1875. | 1876. | 1877. | 1878. | 1879. | 1880. | 1881. | 1882. | 1883. |
| Blooms and billets from ore.. | 36,450 | 24,416 | 20,784 | 24,227 | 24,139 | 30,282 | 40,652 | 45,369 | 48,354 | 35,237 |
| Blooms from pig and scrap iron | 25,220 | 24,827 | 23,844 | 23,073 | 25,906 | 32,071 | 33,937 | 39,237 | 42,939 | 39,521 |
| Total..... | 61,670 | 49,243 | 44,628 | 47,300 | 50,045 | 62,353 | 74,589 | 84,606 | 91,293 | 74,758 |

The following table shows the proportion of ore blooms and billets made in New York in the past nine years, and the proportion of pig and scrap blooms made in Pennsylvania in the same time.

| YEARS. | Net tons of 2,000 pounds. | | | |
|---|---|---|---|---|
| | Ore blooms and billets made in New York. | Total make of ore blooms and billets. | Pig and scrap blooms made in Pennsylvania. | Total make of pig and scrap blooms. |
| 1875..... | 23,666 | 24,416 | 19,032 | 24,827 |
| 1876..... | 20,202 | 20,784 | 13,401 | 23,844 |
| 1877..... | 23,466 | 24,227 | 16,517 | 23,073 |
| 1878..... | 22,829 | 24,139 | 15,121 | 25,906 |
| 1879..... | 27,290 | 30,282 | 23,956 | 32,071 |
| 1880..... | 34,351 | 40,652 | 24,319 | 33,937 |
| 1881..... | 39,892 | 45,369 | 28,342 | 39,237 |
| 1882..... | 43,911 | 48,354 | 29,408 | 42,939 |
| 1883..... | 31,347 | 35,237 | 28,190 | 39,521 |

The production of both products from 1865 to 1883 has been as follows, in net tons. The past year shows a large decrease.

| Years. | Net tons. | Years. | Net tons. | Years. | Net tons. |
|---|---|---|---|---|---|
| 1865..... | 63,977 | 1872..... | 58,000 | 1879..... | 62,353 |
| 1866..... | 73,555 | 1873..... | 62,564 | 1880..... | 74,589 |
| 1867..... | 73,073 | 1874..... | 61,670 | 1881..... | 84,606 |
| 1868..... | 75,200 | 1875..... | 49,243 | 1882..... | 91,293 |
| 1869..... | 69,500 | 1876..... | 44,628 | 1883..... | 74,758 |
| 1870..... | 62,259 | 1877..... | 47,300 | | |
| 1871..... | 63,000 | 1878..... | 50,045 | | |

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## TOTAL PRODUCTION OF IRON AND STEEL FROM 1873 TO 1883.

The annexed table shows the total production of iron and steel in the United States in the eleven years from 1873 to 1883, in net tons.

Net tons of 2,000 pounds.

| PRODUCTS. | 1873. | 1874. | 1875. | 1876. | 1877. | 1878. | 1879. | 1880. | 1881. | 1882. | 1883. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Pig iron | 2,868,278 | 2,689,413 | 2,266,581 | 2,093,236 | 2,314,585 | 2,577,361 | 3,070,875 | 4,295,414 | 4,641,564 | 5,178,122 | 5,146,972 |
| Spiegeleisen, included above | ..... | ..... | 7,892 | 6,616 | 8,945 | 10,674 | 13,981 | 19,603 | 21,086 | 21,963 | 24,574 |
| Rolled iron, including nails and iron rails | 1,887,430 | 1,694,616 | 1,599,516 | 1,509,269 | 1,476,759 | 1,555,576 | 2,047,494 | 2,332,668 | 2,643,927 | 2,493,831 | 2,948,674 |
| Rolled iron, including nails and excluding rails | 1,076,368 | 1,110,147 | 1,097,867 | 1,042101 | 1,144,219 | 1,232,686 | 1,627,324 | 1,838,906 | 2,155,946 | 2,265,567 | 2,288,920 |
| Kegs of cut nails and spikes, included in rolled iron | 4,024,704 | 4,912,180 | 4,726,881 | 4,157,814 | 4,828,918 | 4,396,130 | 5,011,021 | 5,370,512 | 5,794,206 | 6,147,097 | 7,762,787 |
| Bessemer steel rails | 129,015 | 144,944 | 290,963 | 412,461 | 452,169 | 550,398 | 668,964 | 954,460 | 1,330,302 | 1,438,155 | 1,286,554 |
| Open-hearth steel rails | ..... | ..... | ..... | ..... | ..... | 9,397 | 9,149 | 13,615 | 25,217 | 22,765 | 9,186 |
| Iron rails | 761,062 | 584,469 | 501,649 | 467,168 | 382,540 | 322,890 | 420,160 | 493,762 | 488,581 | 227,874 | 64,954 |
| Rails of all kinds | 890,077 | 729,413 | 792,512 | 879,629 | 764,709 | 882,685 | 1,113,273 | 1,461,887 | 1,844,100 | 1,688,794 | 1,360,694 |
| Crucible steel ingots | 34,786 | 36,328 | 39,401 | 39,382 | 40,430 | 42,906 | 56,780 | 72,424 | 89,762 | 85,089 | 80,455 |
| Open-hearth steel ingots | 3,500 | 7,000 | 9,050 | 21,490 | 25,031 | 36,126 | 56,290 | 112,953 | 146,946 | 160,542 | 133,679 |
| Bessemer steel ingots | 170,652 | 191,933 | 375,517 | 525,996 | 560,587 | 732,226 | 928,972 | 1,203,173 | 1,539,157 | 1,696,450 | 1,654,627 |
| Miscellaneous steel | 18,714 | 6,353 | 12,607 | 10,306 | 11,924 | 8,556 | 5,464 | 8,465 | 3,047 | 3,014 | 5,598 |
| Steel of all kinds | 222,652 | 241,614 | 436,575 | 597,174 | 637,972 | 819,814 | 1,047,506 | 1,397,015 | 1,778,912 | 1,945,095 | 1,874,359 |
| Blooms from ore and pig iron | 62,564 | 61,670 | 49,243 | 44,628 | 47,300 | 50,045 | 62,353 | 74,589 | 84,606 | 91,293 | 74,758 |

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## THE IRON AND STEEL PRODUCTION OF ALLEGHENY COUNTY, PENNSYLVANIA.

The following table gives the production of iron and steel in Pittsburgh and the remainder of Allegheny county, Pennsylvania, from 1874 to 1883, in net tons. Allegheny county is well known to be the leading iron and steel producing county in the United States. Recently it has become prominent as a producer of pig iron, all of which is made with Western Pennsylvania coke. In 1883 the production of pig iron in this county was greater than that of any other pig-iron district in the country, surpassing that of the Lehigh Valley in Pennsylvania. Allegheny county produced 592,475 net tons, and the Lehigh Valley produced 575,987 tons. This was the first year in which Allegheny county surpassed the Lehigh Valley.

| YEARS. | Number of iron rolling mills. | Product of iron rails, bar, angle, bolt, rod, and hoop. Tons. | Product of sheet and plate, except nail plate. Tons. | Product of nails. Kegs of 100 pounds. | Total rolled iron, including nails. Net tons. |
|---|---|---|---|---|---|
| 1874..... | 31 | 194,114 | 52,361 | 562,995 | 274,625 |
| 1875..... | 31 | 171,178 | 45,773 | 442,359 | 239,069 |
| 1876..... | 31 | 189,511 | 31,488 | 538,874 | 247,943 |
| 1877..... | 31 | 208,342 | 30,254 | 597,806 | 268,486 |
| 1878..... | 31 | 226,687 | 33,445 | 444,013 | 282,333 |
| 1879..... | 32 | 286,882 | 52,265 | 294,942 | 353,894 |
| 1880..... | 30 | 287,253 | 80,899 | 419,098 | 389,107 |
| 1881..... | 30 | 405,119 | 75,767 | 485,916 | 505,182 |
| 1882..... | 31 | 336,628 | 71,038 | 459,228 | 430,627 |
| 1883..... | 32 | 367,106 | 73,850 | 627,896 | 472,351 |

| YEARS. | Number of blast furnaces. | Make of pig iron. Net tons. | Number of steel works.* | Net tons crucible steel ingots. | Net tons all other steel, including Bessemer ingots. | Total make of steel. Net tons. |
|---|---|---|---|---|---|---|
| 1874..... | 11 | 143,660 | 11 | 17,915 | 6,000 | 23,915 |
| 1875..... | 11 | 131,856 | 14 | 22,942 | 15,498 | 38,440 |
| 1876..... | 11 | 128,555 | 14 | 25,009 | 54,467 | 79,476 |
| 1877..... | 12 | 141,749 | 14 | 24,747 | 82,401 | 107,148 |
| 1878..... | 12 | 217,299 | 14 | 27,866 | 106,948 | 134,814 |
| 1879..... | 13 | 267,315 | 18 | 40,142 | 130,781 | 170,923 |
| 1880..... | 15 | 300,497 | 17 | 52,136 | 169,819 | 221,955 |
| 1881..... | 15 | 385,453 | 17 | 61,256 | 247,345 | 308,601 |
| 1882..... | 16 | 358,840 | 18 | 59,596 | 258,501 | 318,097 |
| 1883..... | 16 | 592,475 | 20 | 59,128 | 346,402 | 405,530 |

* Bessemer steel included; five of these works are also iron rolling mills.

## THE PRODUCTION OF IRON ORE IN 1883.

From A. P. Swineford, Esq., the editor of the Marquette *Mining Journal*, we learn that the production of iron ore by the Lake Superior mines in 1883 was 2,352,889 gross tons, a decrease of 595,418

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tons upon the production of 2,948,307 tons in 1882. The production of the last six years has been as follows, in gross tons:

| Years. | Gross tons. | Years. | Gross tons. |
|---|---|---|---|
| 1878 | 1,125,093 | 1881 | 2,321,315 |
| 1879 | 1,414,182 | 1882 | 2,948,307 |
| 1880 | 1,987,598 | 1883 | 2,352,889 |

The aggregate production of all the Lake Superior iron ore mines since the commencement of their development is 22,943,639 tons, more than the half of which is credited to the six years above mentioned.

The total production of iron ore in the Lake Superior district since the beginning of its development is given by Mr. Swineford in the following table, in gross tons.

| Years. | Gross tons. | Years. | Gross tons. | Years. | Gross tons. |
|---|---|---|---|---|---|
| 1856 and previous | 86,319 | 1866 | 296,713 | 1876 | 993,311 |
| 1857 | 25,646 | 1867 | 465,504 | 1877 | 1,025,129 |
| 1858 | 22,876 | 1868 | 510,522 | 1878 | 1,125,093 |
| 1859 | 68,832 | 1869 | 639,097 | 1879 | 1,414,182 |
| 1860 | 114,401 | 1870 | 859,507 | 1880 | 1,987,598 |
| 1861 | 114,258 | 1871 | 813,984 | 1881 | 2,321,315 |
| 1862 | 124,169 | 1872 | 948,553 | 1882 | 2,948,307 |
| 1863 | 203,055 | 1873 | 1,195,234 | 1883 | 2,352,889 |
| 1864 | 247,059 | 1874 | 935,488 | | |
| 1865 | 193,758 | 1875 | 910,840 | Total | 22,943,639 |

Professor George H. Cook, the State Geologist of New Jersey, in his annual report for 1883, places the production of iron ore in that State in the year mentioned at 521,416 gross tons. The production of 1882 was 932,762 tons. Professor Cook has carefully compiled the following table, giving the statistics of the production of iron ore in New Jersey, in gross tons.

| Years. | Gross tons. | Years. | Gross tons. |
|---|---|---|---|
| 1790 | 10,000 | 1873 | 665,000 |
| 1830 | 20,000 | 1874 | 525,000 |
| 1855 | 100,000 | 1875 | 390,000 |
| 1860 | 164,900 | 1878 | 409,674 |
| 1864 | 226,000 | 1879 | 488,028 |
| 1867 | 275,067 | 1880 | 745,000 |
| 1870 | 362,636 | 1881 | 737,052 |
| 1871 | 450,000 | 1882 | 932,762 |
| 1872 | 600,000 | 1883 | 521,416 |

The production of iron ore in the Champlain district of New York in 1883 was about 500,000 gross tons, a decrease on the production of both 1881 and 1882. The production in 1881 was about 637,000

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tons, and in 1882 it was about 675,000 tons. The mines of the Chateaugay Ore and Iron Company produced 194,306 gross tons in 1883. This was less than the production of the same mines in 1882, which amounted to 224,158 tons. The mines of the Port Henry Iron Ore Company produced 244,980 tons in 1883. Other mines in the district produced about 65,000 tons in 1883.

We learn from Mr. J. Taylor Boyd, general superintendent of the mines of the Cornwall Ore Bank Company, in Lebanon county, Pennsylvania, that the shipments of iron ore from these mines in 1883 amounted to 363,143 gross tons, against 309,680 tons in 1882, and 249,050 tons in 1881.

## COAL STATISTICS FOR 1883 AND PRECEDING YEARS.

The progress of anthracite coal production in Pennsylvania in the past thirteen years is shown in the following table, in gross tons.

| Years. | Gross tons. | Years. | Gross tons. |
|---|---|---|---|
| 1871 | 15,699,721 | 1878 | 17,605,262 |
| 1872 | 19,669,778 | 1879 | 26,142,689 |
| 1873 | 21,227,952 | 1880 | 23,437,242 |
| 1874 | 20,145,121 | 1881 | 28,500,017 |
| 1875 | 19,712,472 | 1882 | 29,120,096 |
| 1876 | 18,501,011 | 1883 | 31,793,027 |
| 1877 | 20,828,179 | | |

It will be observed that the production of 1883 was more than double that of 1871. A decreased production in 1884 is certain.

In the following table we give, from official sources in the office of the Cumberland and Pennsylvania Railroad Company at Mount Savage, Maryland, the shipments of Cumberland coal from the commencement of the trade in 1842, in gross tons. The shipments aggregated 2,544,173 tons in 1883, but only 1,540,466 tons in 1882.

| Years. | Tons. | Years. | Tons. | Years. | Tons. | Years. | Tons. |
|---|---|---|---|---|---|---|---|
| 1842 | 1,708 | 1853 | 533,979 | 1864 | 657,996 | 1875 | 2,342,773 |
| 1843 | 10,082 | 1854 | 659,681 | 1865 | 903,495 | 1876 | 1,835,081 |
| 1844 | 14,890 | 1855 | 662,272 | 1866 | 1,079,331 | 1877 | 1,574,339 |
| 1845 | 24,653 | 1856 | 706,450 | 1867 | 1,193,822 | 1878 | 1,679,322 |
| 1846 | 29,795 | 1857 | 582,486 | 1868 | 1,330,443 | 1879 | 1,730,709 |
| 1847 | 52,940 | 1858 | 649,656 | 1869 | 1,882,669 | 1880 | 2,136,160 |
| 1848 | 79,571 | 1859 | 724,354 | 1870 | 1,717,075 | 1881 | 2,261,918 |
| 1849 | 142,449 | 1860 | 788,909 | 1871 | 2,345,153 | 1882 | 1,540,466 |
| 1850 | 196,848 | 1861 | 269,674 | 1872 | 2,355,471 | 1883 | 2,544,173 |
| 1851 | 257,679 | 1862 | 317,634 | 1873 | 2,674,101 | | |
| 1852 | 334,178 | 1863 | 748,345 | 1874 | 2,410,895 | Total, | 43,988,625 |

In the following table we give the statistics of the total shipments

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of coal and coke by the Monongahela Navigation Company, in Western Pennsylvania, from 1844, when the first shipments were made, to 1883. The shipments are given in bushels, each thousand bushels being the equivalent of 38 gross tons, which makes the weight of a bushel 85.12 pounds. The company carries but little coke; in 1883 it carried only 3,907,589 bushels.

| Years. | Bushels. | Years. | Bushels. | Years. | Bushels. | Years. | Bushels. |
|---|---|---|---|---|---|---|---|
| 1844..... | 737,150 | 1854..... | 17,331,946 | 1864..... | 35,070,917 | 1874..... | 65,881,700 |
| 1845..... | 4,605,185 | 1855..... | 22,234,009 | 1865..... | 39,522,792 | 1875..... | 63,707,500 |
| 1846..... | 7,778,911 | 1856..... | 8,584,095 | 1866..... | 42,605,300 | 1876..... | 68,481,000 |
| 1847..... | 9,645,127 | 1857..... | 28,973,596 | 1867..... | 30,072,700 | 1877..... | 79,480,918 |
| 1848..... | 9,819,361 | 1858..... | 25,696,669 | 1868..... | 45,301,000 | 1878..... | 76,825,255 |
| 1849..... | 9,708,507 | 1859..... | 28,286,671 | 1869..... | 52,512,600 | 1879..... | 65,588,000 |
| 1850..... | 12,297,967 | 1860..... | 37,947,782 | 1870..... | 57,596,400 | 1880..... | 89,377,150 |
| 1851..... | 12,521,228 | 1861..... | 20,865,722 | 1871..... | 48,621,300 | 1881..... | 90,035,360 |
| 1852..... | 14,630,841 | 1862..... | 18,583,956 | 1872..... | 57,280,500 | 1882..... | 106,168,300 |
| 1853..... | 15,716,367 | 1863..... | 26,444,252 | 1873..... | 58,276,995 | 1883..... | 112,395,389 |

Mr. Frederick E. Saward, in his last annual publication, *The Coal Trade*, gives the total production of coal in the United States in 1883 as 96,159,719 gross tons, against 86,849,436 tons in 1882, and 76,221,934 tons in 1881. Mr. Saward says that his figures "are based upon careful reports." Of the total production of coal last year 31,793,027 tons were anthracite and the remainder was bituminous.

## IMMIGRATION INTO THE UNITED STATES FROM 1861 TO 1883.

During the year 1883 the number of persons of foreign birth who emigrated to the United States was 570,316. The following table shows the annual immigration into the United States in the last twenty-three years.

| Calendar years. | Immigrants. | Calendar years. | Immigrants. | Calendar years. | Immigrants. |
|---|---|---|---|---|---|
| 1861..... | 89,724 | 1870..... | 356,303 | 1879..... | 250,565 |
| 1862..... | 89,007 | 1871..... | 346,938 | 1880..... | 593,703 |
| 1863..... | 174,524 | 1872..... | 437,750 | 1881..... | 720,045 |
| 1864..... | 193,195 | 1873..... | 422,545 | 1882..... | 730,349 |
| 1865..... | 247,453 | 1874..... | 260,814 | 1883..... | 570,316 |
| 1866..... | 314,917 | 1875..... | 191,231 | | |
| 1867..... | 310,965 | 1876..... | 157,440 | Total..... | 7,415,925 |
| 1868..... | 289,145 | 1877..... | 130,502 | | |
| 1869..... | 385,287 | 1878..... | 153,207 | | |

The 570,316 immigrants who arrived in the United States in 1883 came from the following countries: Germany, 184,389; Great Britain and Ireland, 157,361; British North American Provinces, 66,950; Sweden, 32,596; Italy, 29,512; Norway, 21,295; Hungary,

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12,308; Switzerland, 11,433; Austria, 11,091; Denmark, 9,747; Russia, 6,907; Bohemia, 6,837; Netherlands, 4,926; France, 4,016; Poland, 2,151; Belgium, 1,673; West Indies, 1,438; Azores, 1,276; Finland, 1,107; Portugal, 650; Australia, 427; Mexico, 411; China, 381; Hawaiian Islands, 284; Greenland and Iceland, 251; Spain, 245; other European countries, 253; other Asiatic countries, 161; Africa, 9; Central America, 26; South America, 67; other islands than those above named, 61; born at sea, 77.

## IRON SHIPBUILDING IN THE UNITED STATES IN 1883.

The following table, compiled from the reports of the Hon. W. P. Titcomb, Assistant Register of the United States Treasury, gives the number and tonnage of iron vessels built in the United States in each fiscal year since 1868, when their construction in this country was commenced. The fiscal year ends on the 30th of June.

| Fiscal Years. | Sailing. | | Steam. | | Total. | |
|---|---|---|---|---|---|---|
| | No. | Tonnage. | No. | Tonnage. | No. | Tonnage. |
| 1868 | ..... | ..... | ..... | 2,801 | ..... | 2,801 |
| 1869 | ..... | 1,039 | ..... | 3,545 | ..... | 4,584 |
| 1870 | ..... | 679 | ..... | 7,602 | ..... | 8,281 |
| 1871 | ..... | 2,067 | 20 | 13,412 | ..... | 15,479 |
| 1872 | ..... | ..... | 20 | 12,766 | 20 | 12,766 |
| 1873 | ..... | ..... | 26 | 26,548 | 26 | 26,548 |
| 1874 | ..... | ..... | 23 | 33,097 | 23 | 33,097 |
| 1875 | ..... | ..... | 20 | 21,632 | 20 | 21,632 |
| 1876 | ..... | ..... | 25 | 21,346 | 25 | 21,346 |
| 1877 | ..... | ..... | 7 | 5,927 | 7 | 5,927 |
| 1878 | ..... | ..... | 32 | 26,960 | 32 | 26,960 |
| 1879 | ..... | ..... | 24 | 22,008 | 24 | 22,008 |
| 1880 | 1 | 44 | 30 | 25,538 | 31 | 25,582 |
| 1881 | 1 | 36 | 41 | 28,320 | 42 | 28,356 |
| 1882 | ..... | ..... | 43 | 40,097 | 43 | 40,097 |
| 1883 | 1 | 2,033 | 34 | 37,613 | 35 | 39,646 |

From the 30th of June, 1883, to the 31st of December of the same year there were built seventeen iron vessels, having a tonnage of 17,855 tons. As far as can now be ascertained these vessels were built within the jurisdiction of the following ports.

| Ports. | Sailing. | | Steam. | | Total. | |
|---|---|---|---|---|---|---|
| | No. | Tonnage. | No. | Tonnage. | No. | Tonnage. |
| New York | ..... | ..... | 1 | 1,064 | 1 | 1,064 |
| Philadelphia, Pa | 1 | 1,997 | 12 | 12,258 | 13 | 14,255 |
| Wilmington, Del | ..... | ..... | 3 | 2,536 | 3 | 2,536 |
| Total | 1 | 1,997 | 16 | 15,858 | 17 | 17,855 |

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John Roach & Son, of Chester, Pennsylvania, are now engaged in the construction of three cruisers for the United States Navy, which are to be built wholly of steel—hulls, ribs, decks, etc., and the same firm launched from its shipyard at Chester on the 12th of April last the dispatch-boat *Dolphin*, also for the Navy, and also constructed wholly of steel. These are not, however, the first vessels that have been built in the United States with steel instead of iron hulls, but the Government statisticians have counted them all as if built of iron. The hulls of the vessels for the Navy, above-mentioned, are made of open-hearth steel.

### RAILROAD STATISTICS FOR 1883.

The following is Mr. H. V. Poor's table of the railroad mileage of the United States from 1830 to 1883, a period of fifty-four years. The figures given in this table denote the length of the railroad lines in the country, without regard to the number of tracks or miles of sidings constructed.

| Years. | Miles in Operat'n. | Annual Incr'se of Mileage. | Years. | Miles in Operat'n. | Annual Incr'se of Mileage. | Years. | Miles in Operat'n. | Annual Incr'se of Mileage. |
|---|---|---|---|---|---|---|---|---|
| 1830..... | 23 | ..... | 1848..... | 5,996 | 398 | 1866..... | 36,801 | 1,716 |
| 1831..... | 95 | 72 | 1849..... | 7,365 | 1,369 | 1867..... | 39,250 | 2,449 |
| 1832..... | 229 | 134 | 1850..... | 9,021 | 1,656 | 1868..... | 42,229 | 2,979 |
| 1833..... | 380 | 151 | 1851..... | 10,982 | 1,961 | 1869..... | 46,844 | 4,615 |
| 1834..... | 633 | 253 | 1852..... | 12,908 | 1,926 | 1870..... | 52,914 | 6,070 |
| 1835..... | 1,098 | 465 | 1853..... | 15,360 | 2,452 | 1871..... | 60,293 | 7,379 |
| 1836..... | 1,273 | 175 | 1854..... | 16,720 | 1,360 | 1872..... | 66,171 | 5,878 |
| 1837..... | 1,497 | 224 | 1855..... | 18,374 | 1,654 | 1873..... | 70,278 | 4,107 |
| 1838..... | 1,913 | 416 | 1856..... | 22,016 | 3,642 | 1874..... | 72,383 | 2,105 |
| 1839..... | 2,302 | 389 | 1857..... | 24,503 | 2,487 | 1875..... | 74,096 | 1,713 |
| 1840..... | 2,818 | 516 | 1858..... | 26,968 | 2,465 | 1876..... | 76,808 | 2,712 |
| 1841..... | 3,535 | 717 | 1859..... | 28,789 | 1,821 | 1877..... | 79,089 | 2,281 |
| 1842..... | 4,026 | 491 | 1860..... | 30,635 | 1,846 | 1878..... | 81,776 | 2,687 |
| 1843..... | 4,185 | 159 | 1861..... | 31,286 | 651 | 1879..... | 86,497 | 4,721 |
| 1844..... | 4,377 | 192 | 1862..... | 32,120 | 834 | 1880..... | 93,545 | 7,174 |
| 1845..... | 4,633 | 256 | 1863..... | 33,170 | 1,050 | 1881..... | 103,334 | 9,789 |
| 1846..... | 4,930 | 297 | 1864..... | 33,908 | 738 | 1882..... | 114,925 | 11,591 |
| 1847..... | 5,598 | 668 | 1865..... | 35,085 | 1,177 | 1883..... | 121,425 | 6,500 |

Owing to an entire re-adjustment of the total mileage in 1880, consequent upon more accurate statements received from the several railroad companies, Mr. Poor gives the miles in operation at the close of that year as 93,545, instead of 93,671 as previously given.

As we have already stated, the number of miles of new railroad that will be built this year will fall below the mileage of last year. The *Railroad Gazette* for April 25th gives the number of miles of track laid on new railroads to that date in 1884 as 543, against 973

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miles in the same period of 1883, and 1,876 miles in the same period of 1882.

### FOREIGN COMMERCE OF THE UNITED STATES SINCE 1861.

The following table, compiled from the reports of the Bureau of Statistics, shows the imports and exports of the United States in each fiscal year from 1861 to 1883, and during the first eight months of the fiscal year 1884. The phrases "net imports" and "domestic exports" indicate that all merchandise and specie imported and re-exported are excluded from the table. The figures in this table have been very carefully revised for these pages by direction of Mr. Nimmo, the Chief of the Bureau.

| Fiscal Years Ended June 30. | Net Imports. | *Gold Value.* | Domestic Exports. | *Gold Value.* |
|---|---|---|---|---|
| | Merchandise. | Specie. | Merchandise. | Specie. |
| 1861 | $274,656,325 | $40,348,401 | $204,899,616 | $23,799,870 |
| 1862 | 178,330,200 | 10,572,063 | 179,644,024 | 31,044,651 |
| 1863 | 225,375,280 | 1,421,056 | 186,003,912 | 55,993,562 |
| 1864 | 301,113,322 | 8,192,633 | 143,504,027 | 100,473,562 |
| 1865 | 209,656,525 | 6,784,970 | 136,940,248 | 64,618,124 |
| 1866 | 423,470,646 | 7,299,395 | 337,518,102 | 82,643,374 |
| 1867 | 381,041,764 | 16,178,299 | 279,786,809 | 54,976,196 |
| 1868 | 344,873,441 | 4,150,241 | 269,389,900 | 83,745,975 |
| 1869 | 406,555,379 | 5,585,462 | 275,166,697 | 42,915,966 |
| 1870 | 419,803,113 | 12,147,315 | 376,616,473 | 43,883,802 |
| 1871 | 505,802,414 | 7,231,395 | 428,398,908 | 84,403,359 |
| 1872 | 610,904,622 | 6,664,395 | 428,487,131 | 72,798,240 |
| 1873 | 624,689,727 | 10,777,909 | 505,033,439 | 73,905,546 |
| 1874 | 550,556,723 | 21,524,187 | 569,433,421 | 59,699,686 |
| 1875 | 518,846,825 | 12,625,704 | 499,284,100 | 83,857,129 |
| 1876 | 445,938,766 | 9,469,070 | 525,582,247 | 50,038,691 |
| 1877 | 438,518,130 | 27,746,915 | 589,670,224 | 43,134,738 |
| 1878 | 422,895,034 | 23,143,074 | 680,709,268 | 27,061,885 |
| 1879 | 433,679,124 | 12,853,594 | 698,340,790 | 17,555,035 |
| 1880 | 656,262,441 | 85,239,284 | 823,946,353 | 9,347,893 |
| 1881 | 624,213,229 | 105,395,594 | 883,925,947 | 14,226,944 |
| 1882 | 707,337,049 | 36,535,182 | 733,239,732 | 43,480,271 |
| 1883 | 703,565,144 | 18,292,239 | 804,223,632 | 21,623,181 |
| 1884 (Eight months) | 434,076,372 | 16,415,796 | 522,310,444 | 14,035,642 |

Note.—The Canadian reports of imports into Canada from the United States indicate that in addition to the above "Domestic Exports" there were exported in the fiscal year 1874 merchandise of the value of $10,200,059; in 1875 merchandise of the value of $15,596,524; in 1876 merchandise of the value of $10,507,563; in 1877 merchandise of the value of $13,051,798; in 1878 merchandise of the value of $10,721,920; in 1879 merchandise of the value of $12,797,478; in 1880 merchandise of the value of $9,802,665; in 1881 merchandise of the value of $9,913,483; in 1882 merchandise of the value of $14,733,107; and in 1883 merchandise of the value of $15,636,298.

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## STOCKS OF ALL KINDS OF PIG IRON UNSOLD AT THE CLOSE OF 1880, 1881, 1882, AND 1883.

*These statistics, collected directly from the manufacturers by The American Iron and Steel Association, represent only stocks in the hands of makers or their agents. They do not include stocks in the hands of consumers or speculators, nor foreign iron.*

| States and Districts. | | Net tons of 2,000 pounds. | | | |
|---|---|---|---|---|---|
| | | 1880. | 1881. | 1882. | 1883. |
| New England | | 6,974 | 4,894 | 9,866 | 12,437 |
| New York | | 56,575 | 29,381 | 37,788 | 65,901 |
| New Jersey | | 20,780 | 7,931 | 12,178 | 25,615 |
| Lehigh Valley | Pennsylvania. | 48,306 | 22,704 | 24,969 | 50,600 |
| Schuylkill Valley | Pennsylvania. | 32,849 | 23,563 | 24,029 | 25,448 |
| Upper Susquehanna | Pennsylvania. | 4,375 | 2,123 | 11,173 | 8,839 |
| Lower Susquehanna | Pennsylvania. | 14,053 | 10,491 | 7,935 | 14,324 |
| Shenango Valley | Pennsylvania. | 26,582 | 7,108 | 22,045 | 27,195 |
| Allegheny County | Pennsylvania. | 3,553 | 500 | 17,272 | 27,240 |
| Miscellaneous coke | Pennsylvania. | 25,247 | 1,321 | 33,194 | 30,822 |
| Charcoal | Pennsylvania. | 9,273 | 5,614 | 10,241 | 11,336 |
| Total for Pennsylvania. | | 164,238 | 73,424 | 150,858 | 195,804 |
| Maryland | | 9,028 | 2,867 | 7,280 | 10,899 |
| Virginia | | 5,803 | 9,938 | 16,116 | 21,172 |
| Georgia, Texas, and N. C. | | 3,656 | 2,915 | 8,948 | 9,429 |
| Alabama | | 6,969 | 3,271 | 20,068 | 9,531 |
| West Virginia | | 5,271 | 40 | 4,268 | 1,900 |
| Kentucky | | 16,215 | 4,506 | 11,186 | 8,216 |
| Tennessee | | 11,643 | 4,350 | 13,392 | 30,047 |
| Hanging Rock | Ohio. | 33,607 | 23,791 | 40,094 | 35,364 |
| Mahoning Valley | Ohio. | 12,826 | ..... | 24,672 | 19,307 |
| Miscellaneous | Ohio. | 43,804 | 8,846 | 22,487 | 18,465 |
| Total for Ohio | Ohio. | 90,237 | 32,637 | 87,253 | 73,136 |
| Michigan and Indiana | | 18,643 | 16,175 | 29,573 | 36,405 |
| Illinois | | 25,134 | ..... | 896 | ..... |
| Wisconsin and Minnesota | | 3,340 | 1,130 | 5,801 | 6,340 |
| Missouri | | 12,152 | 11,695 | 14,223 | 21,641 |
| Colorado and Pacific States | | ..... | 5,742 | ..... | 5,327 |
| Grand total | | 456,658 | 210,896 | 429,694 | 533,800 |
| **STOCKS ACCORDING TO FUEL USED.** | | | | | |
| Bituminous | | 184,626 | 36,495 | 157,196 | 171,802 |
| Anthracite | | 175,862 | 90,351 | 107,259 | 178,020 |
| Charcoal | | 96,170 | 84,050 | 165,239 | 183,978 |
| Total | | 456,658 | 210,896 | 429,694 | 533,800 |

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## PRODUCTION OF ALL KINDS OF PIG IRON IN 1880, 1881, 1882, AND 1883, BY STATES.

*Statistics collected from the manufacturers by The American Iron and Steel Association.*

| STATES. | Net tons of 2,000 pounds. | | | |
|---|---|---|---|---|
| | 1880. | 1881. | 1882. | 1883. |
| Maine | 3,578 | 4,400 | 4,100 | 4,400 |
| Vermont | 1,800 | 2,796 | 1,210 | ..... |
| Massachusetts | 19,017 | 18,318 | 10,335 | 10,760 |
| Connecticut | 22,583 | 28,483 | 24,342 | 19,976 |
| New York | 395,361 | 359,519 | 416,156 | 331,964 |
| New Jersey | 170,049 | 171,672 | 176,805 | 138,773 |
| Pennsylvania | 2,083,121 | 2,190,786 | 2,449,256 | 2,638,891 |
| Maryland | 61,437 | 48,756 | 54,524 | 49,153 |
| Virginia | 29,934 | 83,711 | 87,731 | 152,907 |
| North Carolina | ..... | 800 | 1,150 | ..... |
| Georgia | 27,321 | 37,404 | 42,440 | 45,364 |
| Alabama | 77,190 | 98,081 | 112,765 | 172,465 |
| Texas | 2,500 | 3,000 | 1,321 | 2,381 |
| West Virginia | 70,338 | 66,409 | 73,220 | 88,398 |
| Kentucky | 57,708 | 45,973 | 66,522 | 54,629 |
| Tennessee | 70,873 | 87,406 | 137,602 | 133,963 |
| Ohio | 674,207 | 710,546 | 698,900 | 679,643 |
| Indiana | 12,500 | 7,300 | 10,000 | 9,950 |
| Illinois | 150,556 | 251,781 | 360,407 | 237,657 |
| Michigan | 154,424 | 187,043 | 210,195 | 173,185 |
| Wisconsin | 96,842 | 102,029 | 85,859 | 51,893 |
| Missouri | 105,555 | 109,799 | 113,644 | 103,296 |
| Minnesota | 3,520 | 7,442 | 8,126 | 8,000 |
| Utah Territory | ..... | ..... | 57 | ..... |
| Colorado | ..... | 6,396 | 23,718 | 24,680 |
| Oregon | 5,000 | 6,100 | 6,750 | 7,000 |
| California | ..... | 4,414 | 987 | 5,327 |
| Washington Ty | ..... | 1,200 | ..... | 2,317 |
| Total | 4,295,414 | 4,641,564 | 5,178,122 | 5,146,972 |

### ANTHRACITE PIG IRON.

| STATES. | 1880. | 1881. | 1882. | 1883. |
|---|---|---|---|---|
| Massachusetts | 9,155 | 5,958 | ..... | ..... |
| New York | 367,517 | 322,349 | 385,440 | 306,284 |
| New Jersey | 170,049 | 171,672 | 176,805 | 138,773 |
| Pennsylvania | 1,237,930 | 1,213,353 | 1,453,646 | 1,416,468 |
| Maryland | 23,000 | 21,130 | 26,247 | 24,071 |
| Total | 1,807,651 | 1,734,462 | 2,042,138 | 1,885,596 |

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## PRODUCTION OF PIG IRON.—*Continued.*

### CHARCOAL PIG IRON.

| STATES. | Net tons of 2,000 pounds. | | | |
|---|---|---|---|---|
| | 1880. | 1881. | 1882. | 1883. |
| Maine | 3,578 | 4,400 | 4,100 | 4,400 |
| Vermont | 1,800 | 2,796 | 1,210 | ..... |
| Massachusetts | 9,862 | 12,360 | 10,335 | 10,760 |
| Connecticut | 22,583 | 28,483 | 24,342 | 19,976 |
| New York | 27,844 | 30,467 | 30,716 | 25,680 |
| Pennsylvania | 43,374 | 51,908 | 49,975 | 38,315 |
| Maryland | 33,050 | 27,626 | 28,277 | 23,807 |
| Virginia | 14,043 | 19,038 | 26,133 | 16,879 |
| North Carolina | ..... | 800 | 1,150 | ..... |
| Georgia | 7,277 | 13,404 | 15,565 | 13,045 |
| Alabama | 37,737 | 44,221 | 55,541 | 57,385 |
| Texas | 2,500 | 3,000 | 1,321 | 2,381 |
| West Virginia | 3,245 | 1,200 | ..... | ..... |
| Kentucky | 21,174 | 16,778 | 17,165 | 13,981 |
| Tennessee | 16,675 | 19,046 | 37,611 | 35,299 |
| Ohio | 69,190 | 66,169 | 58,654 | 40,528 |
| Indiana | 2,000 | ..... | ..... | ..... |
| Michigan | 154,424 | 187,043 | 210,195 | 173,185 |
| Wisconsin | 42,913 | 47,702 | 55,369 | 39,349 |
| Missouri | 15,769 | 43,241 | 54,327 | 34,112 |
| Minnesota | 3,520 | 7,442 | 8,126 | 8,000 |
| Utah Territory | ..... | ..... | 57 | ..... |
| Oregon | 5,000 | 6,100 | 6,750 | 7,000 |
| California | ..... | 4,414 | 987 | 5,327 |
| Washington Ty | ..... | 1,200 | ..... | 2,317 |
| Total | 537,558 | 638,838 | 697,906 | 571,726 |

### BITUMINOUS COAL AND COKE PIG IRON.

| | | | | |
|---|---|---|---|---|
| New York | ..... | 6,703 | ..... | ..... |
| Pennsylvania | 801,817 | 925,525 | 945,635 | 1,184,108 |
| Maryland | 5,387 | ..... | ..... | 1,275 |
| Virginia | 15,891 | 64,673 | 61,598 | 136,028 |
| Georgia | 20,044 | 24,000 | 26,875 | 32,319 |
| Alabama | 39,453 | 53,860 | 57,224 | 115,080 |
| West Virginia | 67,093 | 65,209 | 73,220 | 88,398 |
| Kentucky | 36,534 | 29,195 | 49,357 | 40,648 |
| Tennessee | 54,198 | 68,360 | 99,991 | 98,664 |
| Ohio | 605,017 | 644,377 | 640,246 | 639,115 |
| Indiana | 10,500 | 7,300 | 10,000 | 9,950 |
| Illinois | 150,556 | 251,781 | 360,407 | 237,657 |
| Wisconsin | 53,929 | 54,327 | 30,490 | 12,544 |
| Missouri | 89,786 | 66,558 | 59,317 | 69,184 |
| Colorado | ..... | 6,396 | 23,718 | 24,680 |
| Total | 1,950,205 | 2,268,264 | 2,438,078 | 2,689,650 |

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## PRODUCTION OF PIG IRON.—*Continued.*

### PRODUCTION ACCORDING TO FUEL USED.

| KINDS OF FUEL. | Net tons of 2,000 pounds. | | | |
|---|---|---|---|---|
| | 1880. | 1881. | 1882. | 1883. |
| Anthracite | 1,807,651 | 1,734,462 | 2,042,138 | 1,885,596 |
| Charcoal | 537,558 | 638,838 | 697,906 | 571,726 |
| Bituminous | 1,950,205 | 2,268,264 | 2,438,078 | 2,689,650 |
| Total | 4,295,414 | 4,641,564 | 5,178,122 | 5,146,972 |

### PRODUCTION OF PIG IRON IN CERTAIN DISTRICTS.

| | | | | | |
|---|---|---|---|---|---|
| Pennsylvania. | Lehigh Valley | 544,987 | 560,190 | 609,338 | 575,987 |
| | Schuylkill Valley | 306,926 | 309,049 | 342,701 | 337,433 |
| | Upper Susquehanna | 168,128 | 125,785 | 201,367 | 165,629 |
| | Lower Susquehanna | 217,889 | 218,329 | 300,240 | 337,419 |
| | Shenango Valley | 215,313 | 198,968 | 264,078 | 290,069 |
| | Allegheny County | 300,497 | 385,453 | 358,840 | 592,475 |
| | Miscellaneous coke | 286,007 | 341,104 | 322,717 | 301,564 |
| | Charcoal | 43,374 | 51,908 | 49,975 | 38,315 |
| Ohio. | Hanging Rock coke | 60,316 | 77,500 | 77,364 | 82,455 |
| | Mahoning Valley | 226,877 | 245,737 | 258,478 | 244,265 |
| | Hocking Valley | 85,719 | 88,146 | 78,770 | 48,439 |
| | Miscellaneous coke | 232,105 | 232,994 | 225,634 | 263,956 |
| | Hanging Rock charcoal | 64,854 | 61,487 | 55,546 | 38,134 |
| | Miscellaneous charcoal | 4,336 | 4,682 | 3,108 | 2,394 |

### PRODUCTION OF PLATE AND SHEET IRON (EXCLUDING NAIL PLATE) IN THE UNITED STATES IN 1880, 1881, 1882, AND 1883.

| STATES. | Net tons of 2,000 pounds. | | | |
|---|---|---|---|---|
| | 1880. | 1881. | 1882. | 1883. |
| Maine | ..... | ..... | ..... | 1,350 |
| New Hampshire | 100 | ..... | ..... | 26 |
| Massachusetts | 29,640 | 29,446 | 35,688 | 18,626 |
| Connecticut | ..... | ..... | ..... | 50 |
| New York | 2,062 | 4,945 | 3,023 | 677 |
| New Jersey | 921 | 1,823 | 2,016 | 2,305 |
| Pennsylvania | 223,940 | 251,225 | 258,603 | 254,446 |
| Delaware | 10,506 | 10,355 | 12,895 | 12,629 |
| Maryland | 14,645 | 14,215 | 16,590 | 11,491 |
| District of Columbia | 11 | 82 | 29 | 8 |
| West Virginia | 5,550 | 6,234 | 7,991 | 7,781 |
| Kentucky | 10,348 | 6,035 | 16,380 | 14,498 |
| Ohio | 33,826 | 37,327 | 49,182 | 49,987 |
| Indiana | 6,500 | 975 | 542 | ..... |
| Michigan | 7,265 | 5,920 | 3,820 | 3,820 |
| Missouri | 4,343 | 4,500 | 6,055 | 6,168 |
| California | ..... | ..... | ..... | 500 |
| Total | 349,657 | 373,082 | 412,814 | 384,362 |

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## PRODUCTION OF ROLLED IRON (EXCLUDING RAILS AND PLATE AND SHEET IRON) IN 1880, 1881, 1882, AND 1883.

| States. | Bar, bolt, rod, skelp, hoop, and shaped iron, and rolled axles.—Net tons. | | | |
|---|---|---|---|---|
| | 1880. | 1881. | 1882. | 1883. |
| Maine | 7,639 | 5,433 | 10,537 | 8,947 |
| New Hampshire | 3,000 | 3,000 | 3,508 | 2,132 |
| Massachusetts | 48,323 | 58,524 | 46,086 | 47,915 |
| Rhode Island | 7,632 | 10,769 | 11,877 | 14,405 |
| Connecticut | 16,046 | 17,589 | 20,676 | 18,491 |
| New York | 106,274 | 106,372 | 131,226 | 104,229 |
| New Jersey | 48,995 | 56,793 | 76,408 | 56,839 |
| Pennsylvania | 551,302 | 714,113 | 685,049 | 675,226 |
| Delaware | 19,300 | 23,920 | 25,366 | 22,755 |
| Maryland | 19,400 | 18,517 | 17,067 | 17,459 |
| District of Columbia | 265 | 220 | 121 | 141 |
| Virginia | 31,441 | 33,984 | 31,554 | 22,687 |
| Georgia | 1,022 | 3,000 | ..... | ..... |
| Alabama | 6,304 | 8,772 | 8,460 | 6,656 |
| West Virginia | 4,638 | 4,106 | 5,494 | 4,964 |
| Kentucky | 20,677 | 15,425 | 35,247 | 36,531 |
| Tennessee | 6,215 | 5,158 | 10,589 | 9,786 |
| Ohio | 182,677 | 229,247 | 253,933 | 263,247 |
| Indiana | 17,908 | 20,485 | 23,177 | 18,921 |
| Illinois | 33,647 | 52,500 | 48,932 | 94,747 |
| Michigan | 12,539 | 14,685 | 8,004 | 8,080 |
| Wisconsin | 34,683 | 47,478 | 39,611 | 38,946 |
| Missouri | 20,942 | 12,141 | 12,090 | 9,642 |
| California | 10,555 | 14,204 | 22,807 | 20,747 |
| Kansas | 8,900 | 10,528 | 10,800 | ..... |
| Wyoming Territory | 400 | 3,286 | 3,235 | 4,443 |
| Colorado | ..... | 2,306 | 3,934 | 3,486 |
| Total | 1,220,724 | 1,492,555 | 1,545,788 | 1,511,422 |

### PRODUCTION OF CUT NAILS IN KEGS OF 100 POUNDS.

| | | | | |
|---|---|---|---|---|
| Maine | ..... | ..... | ..... | 7,306 |
| Massachusetts | 532,299 | 525,089 | 592,276 | 677,540 |
| New York | 7,482 | 2,256 | 166 | 14,768 |
| New Jersey | 294,122 | 248,521 | 360,340 | 338,107 |
| Pennsylvania | 1,737,560 | 1,914,706 | 1,949,405 | 2,430,552 |
| Virginia | 123,728 | 127,566 | 169,806 | 161,279 |
| Alabama | ..... | ..... | ..... | 20,000 |
| West Virginia | 1,025,155 | 1,241,102 | 1,023,711 | 1,327,484 |
| Kentucky | 120,900 | 69,000 | 149,382 | 144,686 |
| Tennessee | 64,503 | 94,495 | 171,413 | 212,358 |
| Ohio | 824,683 | 860,665 | 796,857 | 1,249,700 |
| Indiana | 289,948 | 326,496 | 394,682 | 413,380 |
| Illinois | 290,132 | 352,643 | 462,956 | 526,108 |
| Nebraska | 60,000 | 31,667 | 60,000 | 65,000 |
| Colorado | ..... | ..... | 16,103 | 62,969 |
| California | ..... | ..... | ..... | 111,500 |
| Total | 5,370,512 | 5,794,206 | 6,147,097 | 7,762,737 |

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## PRODUCTION OF ALL KINDS OF ROLLED IRON (INCLUDING RAILS AND NAIL PLATE) IN THE UNITED STATES IN 1880, 1881, 1882, AND 1883, BY STATES.

*Statistics collected from the manufacturers by The American Iron and Steel Association.*

| States. | Net tons. | | | |
|---|---|---|---|---|
| | 1880. | 1881. | 1882. | 1883. |
| Maine | 7,639 | 7,616 | 10,862 | 10,662 |
| New Hampshire | 3,100 | 3,000 | 3,508 | 2,158 |
| Vermont | 1,650 | ..... | ..... | ..... |
| Massachusetts | 114,250 | 116,846 | 111,388 | 100,418 |
| Rhode Island | 7,632 | 10,769 | 11,877 | 14,405 |
| Connecticut | 16,046 | 17,589 | 20,676 | 18,541 |
| New York | 147,601 | 123,366 | 138,541 | 105,644 |
| New Jersey | 64,622 | 71,286 | 96,441 | 76,109 |
| Pennsylvania | 1,032,602 | 1,254,866 | 1,123,886 | 1,081,163 |
| Delaware | 29,806 | 34,275 | 38,261 | 35,384 |
| Maryland | 40,932 | 32,732 | 33,657 | 28,950 |
| District of Columbia | 276 | 302 | 150 | 149 |
| Virginia | 37,734 | 41,002 | 40,044 | 30,751 |
| Georgia | 1,507 | 7,000 | ..... | ..... |
| Alabama | 6,604 | 11,072 | 9,188 | 8,336 |
| West Virginia | 63,601 | 75,547 | 66,107 | 79,894 |
| Kentucky | 51,406 | 29,915 | 61,096 | 58,263 |
| Tennessee | 25,402 | 33,793 | 38,770 | 22,454 |
| Ohio | 308,566 | 345,727 | 361,608 | 377,962 |
| Indiana | 80,428 | 82,430 | 71,626 | 55,887 |
| Illinois | 109,429 | 148,818 | 93,943 | 121,702 |
| Michigan | 19,804 | 20,605 | 11,824 | 11,900 |
| Wisconsin | 64,890 | 88,643 | 64,296 | 40,195 |
| Missouri | 26,558 | 16,641 | 18,145 | 15,833 |
| Wyoming Territory | 9,821 | 15,172 | 16,488 | 11,288 |
| Kansas | 37,985 | 29,544 | 17,867 | ..... |
| California | 15,277 | 19,839 | 25,843 | 29,732 |
| Colorado | 4,500 | 3,949 | 4,739 | 7,844 |
| Nebraska | 3,000 | 1,583 | 3,000 | 3,250 |
| Total | 2,332,668 | 2,643,927 | 2,493,831 | 2,348,874 |

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## PRODUCTION OF IRON AND STEEL RAILS IN THE UNITED STATES IN 1880, 1881, 1882, AND 1883, BY STATES.

*Statistics collected from the manufacturers by The American Iron and Steel Association.*

| States. | Net tons. | | | | Per cent. of total production in 1883. |
|---|---|---|---|---|---|
| | 1880. | 1881. | 1882. | 1883. | |
| Pennsylvania | 670,198 | 891,179 | 850,908 | 857,818 | 63 |
| Illinois | 322,883 | 433,420 | 362,250 | 232,005 | 17 |
| New York | 109,921 | 109,283 | 105,021 | 76,020 | 6 |
| Missouri | 35,746 | 64,226 | 85,528 | 64,142 | 5 |
| Ohio | 133,487 | 153,596 | 113,806 | 62,518 | 5 |
| Colorado | 4,500 | 1,643 | 18,217 | 19,688 | 1 |
| Indiana | 41,523 | 44,645 | 28,173 | 16,309 | 1 |
| Massachusetts | 9,672 | 2,622 | 15,707 | 12,465 | Less than 1 per cent. each. |
| California | 4,722 | 6,035 | 8,200 | 7,460 | |
| Wyoming Ty | 9,421 | 11,886 | 13,253 | 6,845 | |
| Tennessee | 18,552 | 32,660 | 25,390 | 2,650 | |
| Wisconsin | 30,207 | 41,165 | 24,685 | 1,259 | |
| West Virginia | 2,155 | 3,152 | 1,436 | 775 | |
| Alabama | 300 | 2,300 | 728 | 680 | |
| New Jersey | ..... | 244 | ..... | 60 | |
| Vermont | 17,650 | 15,200 | 26,100 | ..... | |
| Kansas | 29,085 | 19,016 | 7,067 | ..... | |
| Kentucky | 14,336 | 5,005 | 2,000 | ..... | |
| Georgia | 485 | 4,000 | ..... | ..... | |
| Maine | ..... | 2,183 | 325 | ..... | |
| Virginia | 107 | 640 | ..... | ..... | |
| Maryland | 6,887 | ..... | ..... | ..... | |
| Total | 1,461,837 | 1,844,100 | 1,688,794 | 1,360,694 | ..... |

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## PRODUCTION OF ALL SIZES OF IRON RAILS IN THE UNITED STATES IN 1880, 1881, 1882, AND 1883, BY STATES.

*Statistics collected from the manufacturers by The American Iron and Steel Association.*

| States. | Net tons. | | | |
|---|---|---|---|---|
| | 1880. | 1881. | 1882. | 1883. |
| Maine | ..... | 2,183 | 325 | ..... |
| Vermont | 1,650 | ..... | ..... | ..... |
| Massachusetts | 9,672 | 2,622 | ..... | ..... |
| New York | 38,891 | 11,936 | 4,284 | ..... |
| New Jersey | ..... | 244 | ..... | 60 |
| Pennsylvania | 170,482 | 193,793 | 82,764 | 29,963 |
| Maryland | 6,887 | ..... | ..... | ..... |
| Virginia | 107 | 640 | ..... | ..... |
| Georgia | 485 | 4,000 | ..... | ..... |
| Alabama | 300 | 2,300 | 728 | 680 |
| West Virginia | 2,155 | 3,152 | 1,436 | 775 |
| Kentucky | 14,336 | 5,005 | 2,000 | ..... |
| Tennessee | 15,962 | 23,910 | 19,610 | 2,050 |
| Ohio | 50,829 | 36,120 | 18,650 | 2,243 |
| Indiana | 41,523 | 44,645 | 28,173 | 16,297 |
| Illinois | 61,275 | 78,686 | 21,863 | 650 |
| Wisconsin | 30,207 | 41,165 | 24,685 | 1,249 |
| Missouri | 1,273 | ..... | ..... | 23 |
| Wyoming Territory | 9,421 | 11,886 | 13,253 | 6,845 |
| Kansas | 29,085 | 19,016 | 7,067 | ..... |
| California | 4,722 | 5,635 | 3,036 | 2,910 |
| Colorado | 4,500 | 1,643 | ..... | 1,209 |
| Total | 493,762 | 488,581 | 227,874 | 64,954 |

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## AVERAGE PRICES OF No. 1 ANTHRACITE FOUNDRY PIG IRON IN PHILADELPHIA, FROM 1842 TO 1884.—PER TON OF 2,240 LBS.

*Compiled by The American Iron and Steel Association.*

| YEARS. | January. | February. | March. | April. | May. | June. | July. | August. | September. | October. | November. | December. | Average.* | YEARS. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | $ | $ | $ | $ | $ | $ | $ | $ | $ | $ | $ | $ | $ | |
| 1842.. | ..... | ..... | ..... | ..... | 27 | 27 | 26 1/8 | 24 1/8 | 25 1/8 | 25 | 25 | 25 | ..... | ..1842 |
| 1844.. | 24 | 24 | 24 | 24 | 24 | 26 1/8 | 26 1/2 | 26 1/8 | 27 1/4 | 28 | 27 1/2 | 26 3/4 | 25 3/4 | ..1844 |
| 1845.. | 26 3/4 | 26 1/2 | 27 3/4 | 33 1/8 | 34 1/8 | 33 | 31 | 28 1/8 | 27 | 26 7/8 | 28 1/2 | 28 | 29 1/4 | ..1845 |
| 1846.. | 28 | 28 | 28 1/4 | 28 | 28 1/2 | 28 | 29 | 26 1/8 | 27 1/4 | 27 | 28 1/2 | 28 1/8 | 27 7/8 | ..1846 |
| 1847.. | 28 1/2 | 28 1/8 | 28 5/8 | 29 | 29 | 28 5/8 | 28 | 28 1/2 | 30 1/2 | 33 3/4 | 35 3/4 | 33 3/4 | 30 1/4 | ..1847 |
| 1848.. | 31 | 28 1/2 | 27 1/4 | 26 5/8 | 26 1/2 | 26 1/2 | 25 3/4 | 25 5/8 | 25 1/2 | 25 | 25 | 24 7/8 | 26 1/2 | ..1848 |
| 1849.. | 25 | 24 1/2 | 24 3/4 | 24 | †23 1/2 | 23 | †22 3/4 | 22 1/2 | †21 1/8 | 21 1/2 | 20 | 21 | †22 3/4 | ..1849 |
| 1850.. | 21 | 21 | 20 3/4 | 20 7/8 | 20 7/8 | 20 1/8 | 20 | 20 3/4 | 21 | 21 | 21 | 21 3/4 | 20 7/8 | ..1850 |
| 1851.. | 21 1/2 | 22 | 22 | 22 | 21 1/2 | 21 1/2 | 21 | 21 | 21 | 21 | 21 | 21 | 21 3/8 | ..1851 |
| 1852.. | 21 1/4 | 21 1/4 | 20 3/4 | 20 3/8 | 20 1/4 | 20 1/2 | 20 1/4 | 21 1/4 | 23 1/4 | 26 1/2 | 27 3/4 | 28 1/4 | 22 5/8 | ..1852 |
| 1853.. | 32 3/4 | 36 7/8 | 35 5/8 | 35 7/8 | 35 7/8 | 36 | 36 | 36 | 36 1/4 | 37 1/2 | 37 5/8 | 36 3/4 | 36 1/8 | ..1853 |
| 1854.. | 37 | 36 1/2 | 37 | 38 | 38 | 38 | 38 | 38 | 37 3/4 | 36 1/2 | 35 1/4 | 32 7/8 | 36 7/8 | ..1854 |
| 1855.. | 31 1/8 | 29 1/2 | 27 1/2 | 26 3/4 | 26 1/2 | 26 1/8 | 26 1/8 | 26 1/2 | 28 | 28 5/8 | 28 1/2 | 27 3/4 | 27 3/4 | ..1855 |
| 1856.. | 27 1/2 | 27 1/2 | 27 5/8 | 28 | 28 | 27 5/8 | 27 | 27 | 27 | 26 7/8 | 26 | 26 | 27 1/8 | ..1856 |
| 1857.. | 26 1/4 | 26 1/2 | 26 5/8 | 27 3/4 | 27 7/8 | 27 3/4 | 27 1/4 | 26 3/4 | 26 3/8 | 25 3/4 | 23 1/4 | 23 3/4 | 26 3/8 | ..1857 |
| 1858.. | 23 1/2 | 22 1/2 | 22 1/2 | 22 1/2 | 22 1/2 | 22 1/8 | 21 3/8 | 21 1/4 | 22 | 21 1/2 | 21 3/4 | 22 1/2 | 22 1/4 | ..1858 |
| 1859.. | 22 3/4 | 23 5/8 | 24 1/2 | 23 7/8 | 23 1/2 | 23 1/8 | 23 | 23 1/8 | 22 7/8 | 23 1/2 | 23 1/4 | 23 1/2 | 23 3/8 | ..1859 |
| 1860.. | 23 | 23 | 23 3/4 | 22 5/8 | 22 3/4 | 22 3/4 | 22 3/4 | 22 1/8 | 22 1/8 | 22 3/8 | 22 3/4 | 22 1/2 | 22 3/8 | ..1860 |
| 1861.. | 22 1/8 | 21 3/4 | 21 1/4 | 21 7/8 | 21 1/8 | 20 1/2 | 19 7/8 | 18 3/4 | 18 7/8 | 18 7/8 | 18 7/8 | 19 5/8 | 20 1/4 | ..1861 |
| 1862.. | 20 | 20 3/4 | 20 3/4 | 21 1/2 | 21 1/2 | 22 3/4 | 24 | 24 3/8 | 24 1/2 | 25 1/4 | 30 1/2 | 31 1/8 | 23 7/8 | ..1862 |
| 1863.. | 32 | 33 1/4 | 35 1/2 | 36 | 34 3/4 | 33 1/2 | 32 3/4 | 31 5/8 | 33 | 35 3/4 | 41 5/8 | 43 1/2 | 35 1/4 | ..1863 |
| 1864.. | 43 1/8 | 48 5/8 | 50 1/8 | 54 1/2 | 57 1/4 | 57 5/8 | 69 1/8 | ‡73 5/8 | 72 1/4 | 63 3/4 | 61 1/2 | 59 1/8 | ¶59 1/4 | ..1864 |
| 1865.. | 58 1/8 | 53 1/8 | 50 3/8 | 45 1/2 | 39 1/8 | 35 | 35 2/3 | 40 1/8 | 44 1/3 | 49 7/8 | 51 | 50 3/4 | 46 1/8 | ..1865 |
| 1866.. | 50 3/8 | 49 | 46 1/8 | 41 3/8 | 41 3/8 | 43 7/8 | 46 1/2 | 47 1/4 | 48 1/3 | 48 3/4 | 49 1/4 | 49 1/4 | 46 7/8 | ..1866 |
| 1867.. | 48 3/8 | 46 1/4 | 44 3/4 | 41 | 42 3/8 | 43 | 43 1/2 | 44 | 44 1/8 | 44 1/2 | 43 3/4 | 42 1/8 | 44 1/8 | ..1867 |
| 1868.. | 38 2/3 | 36 3/4 | 37 7/8 | 38 1/3 | 37 | 37 | 38 1/6 | 39 1/4 | 40 1/8 | 41 1/8 | 42 7/8 | 43 1/4 | 39 1/4 | ..1868 |
| 1869.. | 42 | 40 1/4 | 41 1/2 | 40 | 39 1/4 | 40 7/8 | 41 5/8 | 41 1/2 | 40 3/4 | 40 1/2 | 39 3/4 | 39 1/2 | 40 5/8 | ..1869 |
| 1870.. | 36 1/4 | 34 1/2 | 34 1/2 | 33 1/4 | 33 1/4 | 32 1/2 | 32 3/4 | 33 1/2 | 33 1/4 | 32 1/4 | 31 1/2 | 31 1/4 | 33 1/4 | ..1870 |
| 1871.. | 30 1/2 | 30 7/8 | 34 1/4 | 35 5/8 | 35 1/2 | 35 | 35 3/4 | 36 | 36 1/2 | 36 3/4 | 37 1/4 | 37 1/2 | 35 1/8 | ..1871 |
| 1872.. | 37 | 40 3/4 | 47 | 49 1/2 | 49 1/2 | 45 | 53 5/8 | 51 1/2 | 52 3/4 | 53 7/8 | 53 1/3 | 51 1/4 | 47 5/8 | 48 7/8 | ..1872 |
| 1873.. | 45 1/8 | 48 | 48 3/8 | 47 3/4 | 46 | 45 | 43 3/4 | 43 1/2 | 42 1/2 | 38 | 33 | 32 1/2 | 42 3/8 | ..1873 |
| 1874.. | 32 | 32 | 32 | 32 | 31 1/2 | 31 1/2 | 31 1/2 | 31 | 29 1/2 | 29 | 26 1/4 | 24 | 30 1/2 | ..1874 |
| 1875.. | 25 3/4 | 26 1/2 | 27 | 27 | 26 | 26 | 26 | 26 | 25 | 24 | 23 3/4 | 23 1/4 | 25 1/2 | ..1875 |
| 1876.. | 23 1/4 | 23 | 23 | 23 1/4 | 22 | 22 | 22 | 22 | 21 3/4 | 21 3/4 | 21 1/2 | 21 1/4 | 22 1/4 | ..1876 |
| 1877.. | 20 3/4 | 20 | 20 | 19 1/2 | 19 | 18 3/4 | 18 1/4 | 18 | 18 1/4 | 18 1/2 | 18 | 18 | 18 7/8 | ..1877 |
| 1878.. | 18 1/4 | 18 1/2 | 18 1/2 | 18 1/2 | 18 | 17 1/4 | 17 1/4 | 17 1/2 | 17 1/2 | 17 | ‖16 1/2 | 17 | ‖17 5/8 | ..1878 |
| 1879.. | 17 1/4 | 17 1/2 | 17 7/8 | 18 | 18 1/2 | 18 3/4 | 19 1/4 | 20 3/4 | 24 1/4 | 30 | 28 | 30 1/2 | 21 1/2 | ..1879 |
| 1880.. | 40 | 41 | 37 1/2 | 31 | 25 | 23 | 23 1/2 | 25 | 23 1/4 | 23 | 24 1/2 | 25 | 28 1/2 | ..1880 |
| 1881.. | 25 | 25 1/2 | 26 | 25 | 25 | 24 | 24 1/2 | 24 1/2 | 25 1/4 | 25 1/2 | 25 3/4 | 26 | 25 1/2 | ..1881 |
| 1882.. | 26 | 26 | 25 3/4 | 25 1/2 | 25 1/2 | 25 1/2 | 25 1/2 | 25 1/2 | 26 | 26 1/4 | 26 | 25 3/4 | 25 3/4 | ..1882 |
| 1883.. | 25 | 24 1/2 | 24 | 23 1/2 | 22 | 21 | 21 1/2 | 22 | 22 | 21 1/2 | 21 | 21 | 22 3/8 | ..1883 |
| 1884.. | 20 1/2 | 20 1/2 | 20 1/2 | 20 | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..1884 |

* Average for year to nearest *eighth*.

† Uncertain.

‡ Lowest average for month, $16 1/2—November, 1878.

‡ Highest average for month, $73 5/8—August, 1864.

‖ Lowest average for year, $17 5/8—1878.

¶ Highest average for year, $59 1/4—1864.

☞ From 1842 to July, 1866, averaged monthly from weekly quotations in Philadelphia and New York prices current. From July, 1866, to 1883 averaged from weekly quotations in The Bulletin of The American Iron and Steel Association.

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## AVERAGE PRICES OF IRON RAILS, AT MILLS IN EASTERN PENNSYLVANIA, FROM 1847 TO 1883.—PER TON OF 2,240 LBS.

| YEARS. | January. | February. | March. | April. | May. | June. | July. | August. | September. | October. | November. | December. | Average. | Average price of gold. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | $ | $ | $ | $ | $ | $ | $ | $ | $ | $ | $ | $ | $ | |
| 1847... | ..... | 71⅜ | 70⅛ | 70 | 70 | 70 | 69½ | 69½ | 67½ | 67 | 67½ | 67½ | ..... | 100 |
| 1848... | 63 | 63 | 63 | 63 | 63 | 63 | 63 | 61⅝ | 61½ | 61 | 61 | 61 | 62¼ | 100 |
| 1849... | 61 | 57½ | 58¾ | 53⅓ | 54¼ | 53½ | 53½ | 53¾ | 52 | 51½ | 51½ | 51½ | 53⅞ | 100 |
| 1850... | 47 | 47½ | 48 | 49 | 49 | 50 | 46 | 46¾ | 47½ | 48 | 48 | 48 | 47⅞ | 100 |
| 1851... | 43 | 45 | 47½ | 45 | 45 | 48 | 46 | 45½ | 45 | 45 | 46 | 46¼ | 45⅝ | 100 |
| 1852... | 46½ | 46½ | 46½ | 46½ | 46½ | 46½ | 46½ | 46½ | 47¾ | 49⅓ | 51 | 61 | 48⅜ | 100 |
| 1853... | 74⅙ | 77½ | 77½ | 77½ | 77½ | 77½ | 77½ | 77½ | 77½ | 77¼ | 77½ | 77½ | 77¼ | 100 |
| 1854... | 81 | 81 | 81 | 81 | 81 | 81 | 81 | 81 | 81 | 81 | 77½ | 73½ | 80⅛ | 100 |
| 1855... | 70 | 65 | 62½ | 62½ | 60 | 58⅓ | 59½ | 59½ | 64½ | 65 | 65 | 63 | 62½ | 100 |
| 1856... | 62½ | 62⅙ | 63⅜ | 65 | 65 | 65 | 65 | 65 | 65 | 65 | 65 | 64 | 64⅛ | 100 |
| 1857... | 65½ | 65½ | 64½ | 65¾ | 67 | 67 | 67 | 67 | 67 | 67 | 58½ | 50 | 64¼ | 100 |
| 1858... | 50 | 50 | 50 | 50 | 50 | 50 | 50 | 50 | 50 | 50 | 50 | 50 | 50 | 100 |
| 1859... | 49¾ | 49¼ | 49¼ | 50⅙ | 50¼ | 50¼ | 49¾ | 48¾ | 48¾ | 48¾ | 48¾ | 48¾ | 49⅜ | 100 |
| 1860... | 48¾ | 48¾ | 48¾ | 48¾ | 48¾ | 48¾ | 48¾ | 46 | 47 | 47½ | 47½ | 46½ | 48 | 100 |
| 1861... | 44 | 44 | 44 | 44 | 44 | 44 | 44 | 43½ | 43 | 41⅜ | 36½ | 36½ | 42⅜ | 100 |
| 1862... | 36½ | 36½ | 41½ | 41½ | 41½ | 41½ | 41½ | 41½ | 43 | 43¾ | 46 | 46 | 41⅜ | 113 |
| 1863... | 72½ | 69¾ | 72¼ | 78½ | 73½ | 78¾ | 81½ | 73⅝ | 72½ | 79½ | 87½ | 87½ | 76⅞ | 145 |
| 1864... | 94 | 101¼ | 105 | 111 | 120 | 127½ | 141½ | 152½ | 153¾ | 140 | 133¾ | 132 | 126 | 202 |
| 1865... | 125⅝ | 121¼ | 116¼ | 108½ | 90¼ | 84¼ | 82½ | 86¼ | 90 | 92½ | 95 | 91 | 98⅝ | 157 |
| 1866... | 90 | 90 | 87¾ | 84¾ | 84 | 85¾ | 86⅝ | 87 | 87⅝ | 87⅞ | 85 | 85 | 86¾ | 140 |
| 1867... | 85 | 85 | 84¼ | 82⅞ | 82½ | 82½ | 82½ | 82½ | 82½ | 82½ | 82½ | 82½ | 83⅛ | 138 |
| 1868... | 81⅜ | 79 | 79 | 79 | 79 | 79 | 79 | 79 | 79 | 78¼ | 76 | 78¾ | 78⅞ | 140 |
| 1869... | 76¾ | 76 | 76 | 76 | 76 | 76 | 76 | 80 | 78¼ | 78½ | 78½ | 78½ | 77½ | 136 |
| 1870... | 74 | 72½ | 72½ | 72½ | 72⅛ | 72½ | 72½ | 72½ | 72½ | 72½ | 70½ | 70 | 72¼ | 115 |
| 1871... | 68¼ | 69 | 69 | 69½ | 71 | 71 | 71 | 71 | 71 | 71 | 71 | 71 | 70⅝ | 112 |
| 1872... | 71⅛ | 75⅝ | 81½ | 83⅞ | 90½ | 90 | 89 | 87¾ | 88¾ | 88¾ | 88¾ | 85½ | 85½ | 112 |
| 1873... | 83⅓ | 83 | 83 | 82 | 80 | 78 | 76 | 75 | 75 | 70 | 68 | 66 | 76⅔ | 113 |
| 1874... | 66 | 64 | 62 | 60 | 60 | 60 | 60 | 58 | 58 | 55 | 52 | 50 | 58¾ | 112 |
| 1875... | 50 | 50 | 50 | 49 | 49 | 49 | 48½ | 47 | 46½ | 46 | 45½ | 43¾ | 47¾ | 114 |
| 1876... | 43½ | 43 | 42½ | 42 | 42 | 41 | 41 | 41 | 40 | 40 | 39½ | 39 | 41¼ | 110 |
| 1877... | 38 | 38 | 38 | 37½ | 37 | 34½ | 34½ | 34 | 33 | 32½ | 33 | 33 | 35¼ | 105 |
| 1878... | 33½ | 33½ | 33½ | 33½ | 33⅓ | 33½ | 34 | 34 | 34 | 34 | 34 | 34 | 33¾ | 102 |
| 1879... | 34 | 34½ | 35 | 35½ | 37½ | 38½ | 40 | 41 | 44 | 48 | 53 | 54 | 41¼ | 100 |
| 1880... | 65 | 68 | 66 | 60 | 50 | 46¼ | 45 | 46 | 46 | 46 | 46½ | 45¼ | 49¼ | 100 |
| 1881... | 46½ | 47½ | 47 | 47 | 46½ | 46½ | 46¾ | 47 | 47¾ | 47½ | 47¾ | 48 | 47⅛ | 100 |
| 1882... | 48½ | 48½ | 47½ | 47 | 44¾ | 44¾ | 45 | 45 | 44 | 44 | 44 | 44 | 45½ | 100 |
| 1883... | ..... | ..... | ..... | ..... | No | quot ations. | ..... | ..... | ..... | ..... | ..... | ..... | ..... | 100 |

## AVERAGE PRICES OF BESSEMER STEEL RAILS, AT WORKS IN PENNSYLVANIA, FROM 1868 TO 1884.—PER TON OF 2,240 LBS.

| YEARS. | January. | February. | March. | April. | May. | June. | July. | August. | September. | October. | November. | December. | Yearly Average. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | $ | $ | $ | $ | $ | $ | $ | $ | $ | $ | $ | $ | $ |
| 1868... | 165 | 167½ | 174 | 172 | 165 | 162½ | 150 | 150 | 150 | 150 | 148 | 147½ | 158½ |
| 1869... | 145 | 143¾ | 135 | 134 | 130¼ | 128 | 130 | 130 | 130 | 130½ | 130¼ | 120 | 132¼ |
| 1870... | 110 | 110 | 108½ | 107 | 106 | 109¼ | 110 | 110 | 108¾ | 101⅔ | 102½ | 98 | 106¾ |
| 1871... | 95 | 96 | 106 | 95 | 103 | 104 | 103¾ | 104 | 106 | 105⅔ | 105¼ | 106½ | 102½ |
| 1872... | 104½ | 104 | 104¼ | 111½ | 110 | 113 | 114½ | 115¼ | 114 | 113½ | 118 | 120¾ | 112 |
| 1873... | 121 | 120 | 122½ | 120¼ | 120 | 121¾ | 121¾ | 121¾ | 118 | 120 | 120 | 120 | 120½ |
| 1874... | 117½ | 117½ | 115 | 98⅔ | 98⅓ | 96¼ | 91 | 89¼ | 78¼ | 78¼ | 75⅔ | 75⅔ | 94¼ |
| 1875... | 71 | 71 | 71 | 69 | 69 | 69 | 69 | 69 | 69 | 67 | 66 | 65 | 68¾ |
| 1876... | 67 | 65 | 62 | 62 | 62 | 60 | 59 | 59 | 56 | 54 | 53 | 52 | 59¼ |
| 1877... | 49 | 49 | 49 | 49 | 47¼ | 46½ | 45¼ | 44¾ | 44 | 42¼ | 40½ | 40½ | 45¼ |
| 1878... | 41 | 41½ | 41½ | 42 | 43½ | 43 | 43½ | 42½ | 42½ | 42½ | 42 | 41 | 42¼ |
| 1879... | 41 | 42 | 43 | 42½ | 42 | 43 | 44 | 48 | 50 | 55 | 61 | 67 | 48¼ |
| 1880... | 75 | 85 | 82 | 75 | 65 | 63¾ | 62½ | 63¾ | 61¼ | 60 | 59 | 58 | 67½ |
| 1881... | 60 | 62 | 62½ | 63 | 63 | 60 | 61 | 60 | 60 | 60 | 61¼ | 60 | 61¼ |
| 1882... | 58 | 55 | 54 | 52¾ | 48¾ | 48¼ | 48 | 47 | 45 | 44¼ | 42 | 39 | 48¼ |
| 1883... | 40 | 39½ | 39 | 38½ | 38 | 38 | 38 | 38 | 37½ | 37 | 35 | 34½ | 37¾ |
| 1884... | 34 | 34 | 34 | 34 | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |

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## AVERAGE WHOLESALE STORE PRICES OF BEST REFINED ROLLED BAR IRON IN PHILADELPHIA, FROM 1844 TO 1884.

*Compiled by The American Iron and Steel Association, from the sales books of several prominent Philadelphia iron merchants. Per ton of 2,240 pounds.*

| YEARS. | January. | February. | March. | April. | May. | June. | July. | August. | September. | October. | November. | December. | Average. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | $ | $ | $ | $ | $ | $ | $ | $ | $ | $ | $ | $ | $ |
| 1844... | 90 00 | 90 00 | 90 00 | 90 00 | 90 00 | 82 50 | 82 50 | 82 50 | 82 50 | 82 50 | 82 50 | 82 50 | 85 62 |
| 1845... | 82 50 | 87 50 | 92 50 | 100 00 | 100 00 | 100 00 | 95 00 | 92 50 | 92 50 | 92 50 | 95 00 | 95 00 | 93 75 |
| 1846... | 95 00 | 95 00 | 90 00 | 92 50 | 92 50 | 92 50 | 95 00 | 92 50 | 90 00 | 90 00 | 90 00 | 85 00 | 91 66 |
| 1847... | 85 00 | 85 00 | 85 00 | 85 00 | 85 00 | 90 00 | 90 00 | 85 00 | 87 50 | 85 00 | 85 00 | 85 00 | 86 04 |
| 1848... | 85 00 | 85 00 | 85 00 | 85 00 | 85 00 | 80 00 | 80 00 | 80 00 | 75 00 | 75 00 | 67 50 | 70 00 | 79 33 |
| 1849... | 70 00 | 70 00 | 70 00 | 70 00 | 70 00 | 70 00 | 65 00 | 65 00 | 65 00 | 65 00 | 65 00 | 65 00 | 67 50 |
| 1850... | 65 00 | 65 00 | 65 00 | 62 50 | 60 00 | 57 50 | 57 50 | 57 50 | 57 50 | 56 00 | 56 00 | 55 00 | 59 54 |
| 1851... | 55 00 | 55 00 | 55 00 | 55 00 | 55 00 | 55 00 | 55 00 | 55 00 | 54 00 | 54 00 | 54 00 | 54 00 | 54 66 |
| 1852... | 54 00 | 54 00 | 52 50 | 52 50 | 52 50 | 52 50 | 52 50 | 55 00 | 60 00 | 70 00 | 70 00 | 80 00 | 58 79 |
| 1853... | 90 00 | 90 00 | 90 00 | 87 50 | 85 00 | 80 00 | 80 00 | 77 50 | 77 50 | 80 00 | 80 00 | 85 00 | 83 50 |
| 1854... | 90 00 | 90 00 | 90 00 | 90 00 | 90 00 | 92 50 | 95 00 | 95 00 | 95 00 | 92 50 | 90 00 | 90 00 | 91 33 |
| 1855... | 82 50 | 80 00 | 75 00 | 72 50 | 70 00 | 70 00 | 70 00 | 72 50 | 72 50 | 75 00 | 77 50 | 77 50 | 74 58 |
| 1856... | 75 00 | 77 50 | 77 50 | 77 50 | 75 00 | 72 50 | 70 00 | 70 00 | 72 50 | 72 50 | 72 50 | 72 50 | 73 75 |
| 1857... | 72 50 | 72 50 | 72 50 | 72 50 | 72 50 | 72 50 | 70 00 | 70 00 | 70 00 | 70 00 | 70 00 | 67 50 | 71 04 |
| 1858... | 65 00 | 65 00 | 65 00 | 62 50 | 62 50 | 65 00 | 62 50 | 60 00 | 60 00 | 60 00 | 60 00 | 60 00 | 62 29 |
| 1859... | 60 00 | 60 00 | 60 00 | 60 00 | 60 00 | 60 00 | 60 00 | 60 00 | 60 00 | 60 00 | 60 00 | 60 00 | 60 00 |
| 1860... | 60 00 | 57 50 | 57 50 | 57 50 | 57 50 | 57 50 | 57 50 | 60 00 | 60 00 | 60 00 | 60 00 | 60 00 | 58 75 |
| 1861... | 60 00 | 60 00 | 60 00 | 60 00 | 60 00 | 60 00 | 60 00 | 60 00 | 62 50 | 62 50 | 62 50 | 62 50 | 60 83 |
| 1862... | 62 50 | 62 50 | 62 50 | 62 50 | 65 00 | 65 00 | 70 00 | 72 50 | 75 00 | 77 50 | 82 50 | 87 50 | 70 42 |
| 1863... | 87 50 | 90 00 | 90 00 | 90 00 | 90 00 | 87 50 | 87 50 | 87 50 | 87 50 | 90 00 | 95 00 | 110 00 | 91 04 |
| 1864... | 115 00 | 125 00 | 130 00 | 140 00 | 150 00 | 160 00 | 165 00 | 170 00 | 160 00 | 150 00 | 147 50 | 145 00 | 146 46 |
| 1865... | 142 50 | 135 00 | 130 00 | 110 00 | 100 00 | 92 50 | 90 00 | 85 00 | 92 50 | 95 00 | 100 00 | 105 00 | 106 38 |
| 1866... | 105 00 | 100 00 | 97 50 | 95 00 | 92 50 | 95 00 | 105 00 | 100 00 | 100 00 | 97 50 | 95 00 | 95 00 | 98 13 |
| 1867... | 95 00 | 92 50 | 92 50 | 90 00 | 87 50 | 87 50 | 85 00 | 82 50 | 82 50 | 82 50 | 82 50 | 85 00 | 87 08 |
| 1868... | 85 00 | 85 00 | 85 00 | 87 50 | 87 50 | 87 50 | 85 00 | 85 00 | 85 00 | 85 00 | 85 00 | 85 00 | 85 63 |
| 1869... | 82 50 | 82 50 | 82 50 | 82 50 | 82 50 | 82 50 | 82 50 | 82 50 | 80 00 | 80 00 | 80 00 | 80 00 | 81 66 |
| 1870... | 80 00 | 77 50 | 77 50 | 77 50 | 75 00 | 77 50 | 80 00 | 85 00 | 82 50 | 80 00 | 77 50 | 77 50 | 78 96 |
| 1871... | 72 50 | 75 00 | 75 00 | 77 50 | 75 00 | 77 50 | 77 50 | 80 00 | 82 50 | 82 50 | 82 50 | 85 00 | 78 54 |
| 1872... | 73 92 | 78 40 | 87 36 | 94 08 | 96 32 | 98 56 | 103 04 | 105 28 | 107 52 | 118 72 | 107 52 | 100 80 | 97 63 |
| 1873... | 96 32 | 94 08 | 96 32 | 94 08 | 94 08 | 91 84 | 85 12 | 82 88 | 80 64 | 76 16 | 73 92 | 71 68 | 86 43 |
| 1874... | 73 92 | 73 92 | 71 68 | 71 68 | 67 20 | 67 20 | 62 72 | 67 20 | 67 20 | 67 20 | 62 72 | 62 72 | 67 95 |
| 1875... | 62 72 | 60 48 | 62 72 | 62 72 | 62 72 | 62 72 | 62 72 | 60 48 | 60 48 | 60 48 | 56 00 | 56 00 | 60 85 |
| 1876... | 56 00 | 52 64 | 52 64 | 52 64 | 52 64 | 52 64 | 52 64 | 52 64 | 50 40 | 50 40 | 50 40 | 49 28 | 52 08 |
| 1877... | 48 72 | 47 60 | 47 04 | 44 80 | 44 80 | 44 80 | 44 80 | 44 80 | 44 80 | 44 80 | 44 80 | 44 80 | 45 55 |
| 1878... | 44 80 | 44 80 | 44 80 | 44 80 | 44 80 | 44 80 | 44 80 | 44 80 | 44 80 | 42 56 | 42 56 | 42 56 | 44 24 |
| 1879... | 40 32 | 42 56 | 44 80 | 44 80 | 44 80 | 44 80 | 47 04 | 49 28 | 57 12 | 67 20 | 67 20 | 72 24 | 51 85 |
| 1880... | 80 64 | 85 12 | 82 32 | 71 68 | 56 00 | 51 07 | 50 02 | 58 76 | 54 88 | 52 64 | 52 64 | 53 76 | 60 38 |
| 1881... | 56 00 | 56 00 | 56 00 | 56 00 | 53 76 | 53 76 | 54 88 | 57 12 | 60 48 | 62 72 | 64 96 | 64 96 | 58 05 |
| 1882... | 64 96 | 67 20 | 67 20 | 62 72 | 58 24 | 60 48 | 60 48 | 60 48 | 60 48 | 60 48 | 58 24 | 56 00 | 61 41 |
| 1883... | 53 76 | 52 64 | 51 52 | 50 40 | 50 40 | 50 40 | 50 40 | 49 28 | 49 28 | 49 28 | 49 28 | 47 04 | 50 30 |
| 1884... | 44 80 | 44 80 | 44 80 | 44 80 | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |

The highest price in any month in the above table was reached in August, 1864, $170; the lowest price in any month was in January, 1879, $40.32. The highest average price reached in any year was in 1864, $146.46; the lowest average price in any year was in 1878, $44.24.

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## PRICES IN DOLLARS OF ANTHRACITE COAL FROM 1826 TO 1884.

*Prices of Schuylkill White Ash Lump Coal, by the Cargo, at Philadelphia. Averaged monthly from mean of weekly quotations. Per ton of 2,240 lbs.*

| YEARS. | January. | February. | March. | April. | May. | June. | July. | August. | September. | October. | November. | December. | Average. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1826.. | ..... | ..... | ..... | 7.00 | 7.00 | 7.00 | 7.00 | 7.00 | 7.00 | 7.00 | 7.50 | 7.80 | ..... |
| 1827.. | 7.00 | 7.00 | 7.00 | 7.00 | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| 1829.. | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | 7.50 | 7.50 | 7.25 | ..... |
| 1830.. | 7.25 | 7.25 | 6.00 | 5.75 | 5.75 | 5.75 | 5.75 | 5.75 | 5.75 | 5.75 | ..... | ..... | ..... |
| 1833.. | ..... | ..... | 6.00 | 5.50 | 5.25 | 5.25 | 5.25 | 5.25 | 5.17½ | 4.87½ | 4.87½ | 4.87½ | ..... |
| 1834.. | 4.87 | 4.87 | 4.87 | 4.87 | 4.87 | 4.87 | 4.87 | 4.87 | 4.87 | 4.87 | 4.87 | 4.50 | 4.84 |
| 1835.. | 4.56 | 4.56 | 4.56 | 4.56 | 4.60 | 4.63 | 4.63 | 4.68 | 4.88 | 4.90 | 5.03 | 6.47 | 4.84 |
| 1836.. | 7.70 | 7.44 | 7.31 | 6.58 | 5.38 | 5.50 | 5.50 | 6.19 | 6.41 | 6.50 | 7.13 | 8.05 | 6.64 |
| 1837.. | 8.25 | 8.25 | 8.04 | 6.78 | 6.50 | 6.38 | 6.10 | 6.00 | 6.00 | 6.09 | 6.13 | 6.13 | 6.72 |
| 1838.. | 6.13 | 5.91 | 5.28 | 5.25 | 5.16 | 5.13 | 5.13 | 5.13 | 5.10 | 5.00 | 5.00 | 5.00 | 5.27 |
| 1839.. | 5.00 | 5.00 | 5.00 | 5.00 | 5.00 | 5.00 | 5.00 | 5.00 | 5.00 | 5.00 | 5.00 | 5.00 | 5.00 |
| 1840.. | 5.00 | 5.00 | 5.00 | 5.00 | 5.00 | 4.63 | 4.63 | 4.63 | 4.66 | 4.95 | 5.06 | 5.34 | 4.91 |
| 1841.. | 6.40 | 7.00 | 6.44 | 5.88 | 5.69 | 5.17 | 5.13 | 5.27 | 5.56 | 5.63 | 5.63 | 5.63 | 5.79 |
| 1842.. | 5.63 | 5.56 | 5.06 | 4.38 | 4.03 | 3.88 | 3.83 | 3.60 | 3.56 | 3.51 | 3.56 | 3.56 | 4.18 |
| 1843.. | 3.50 | 3.25 | 3.25 | 3.25 | 3.25 | 3.25 | 3.25 | 3.25 | 3.25 | 3.25 | 3.25 | 3.25 | 3.27 |
| 1844.. | 3.50 | 3.33 | 3.10 | 3.02 | 3.00 | 3.03 | 3.13 | 3.21 | 3.26 | 3.26 | 3.27 | 3.26 | 3.20 |
| 1845.. | 3.26 | 3.26 | 3.27 | 3.31 | 3.31 | 3.31 | 3.44 | 3.44 | 3.59 | 3.74 | 3.76 | 3.81 | 3.46 |
| 1846.. | 3.81 | 3.75 | 3.72 | 3.84 | 3.87 | 3.97 | 4.00 | 3.94 | 3.96 | 3.88 | 4.00 | 4.00 | 3.90 |
| 1847.. | 3.88 | 3.81 | 3.81 | 3.81 | 3.60 | 3.63 | 3.69 | 3.83 | 3.95 | 3.88 | 3.88 | 3.88 | 3.80 |
| 1848.. | 3.90 | 3.90 | 3.58 | 3.44 | 3.37 | 3.29 | 3.33 | 3.56 | 3.46 | 3.41 | 3.39 | 3.36 | 3.50 |
| 1849.. | 3.36 | 3.36 | 3.45 | 3.62 | 3.62 | 3.86 | 3.88 | 3.81 | 3.75 | 3.69 | 3.57 | 3.50 | 3.62 |
| 1850.. | 3.50 | 3.50 | 3.40 | 3.31 | 3.25 | 3.25 | 3.25 | 3.25 | 4.25 | 4.25 | 4.25 | 4.25 | 3.64 |
| 1851.. | 4.28 | 4.13 | 3.56 | 3.31 | 3.10 | 3.00 | 3.00 | 3.05 | 3.17 | 3.20 | 3.25 | 3.00 | 3.34 |
| 1852.. | 3.18 | 3.47 | 3.40 | 3.44 | 3.44 | 3.45 | 3.45 | 3.50 | 3.56 | 3.56 | 3.56 | 3.50 | 3.46 |
| 1853.. | 3.42 | 3.44 | 3.45 | 3.47 | 3.47 | 3.47 | 3.47 | 3.64 | 4.03 | 4.19 | 4.19 | 4.10 | 3.70 |
| 1854.. | 4.50 | 4.50 | 4.25 | 4.39 | 4.81 | 5.16 | 5.55 | 6.00 | 6.00 | 5.81 | 5.68 | 5.60 | 5.19 |
| 1855.. | 5.60 | 5.28 | 4.53 | 4.50 | 4.50 | 4.45 | 4.28 | 4.19 | 4.19 | 4.19 | 4.15 | 4.06 | 4.49 |
| 1856.. | 4.06 | 4.25 | 4.25 | 4.25 | 4.05 | 4.00 | 4.00 | 4.00 | 4.12 | 4.13 | 4.10 | 4.08 | 4.11 |
| 1857.. | 3.92 | 3.92 | 3.92 | 3.89 | 3.85 | 3.85 | 3.88 | 3.87 | 3.85 | 3.82 | 3.82 | 3.82 | 3.87 |
| 1858.. | 3.83 | 3.83 | 3.77 | 3.47 | 3.22 | 3.23 | 3.35 | 3.25 | 3.32 | 3.32 | 3.32 | 3.30 | 3.43 |
| 1859.. | 3.28 | 3.38 | 3.34 | 3.20 | 3.20 | 3.20 | 3.20 | 3.20 | 3.19 | 3.20 | 3.34 | 3.29 | 3.25 |
| 1860.. | 3.28 | 3.29 | 3.30 | 3.30 | 3.23 | 3.31 | 3.36 | 3.39 | 3.50 | 3.53 | 3.62 | 3.63 | 3.40 |
| 1861.. | 3.63 | 3.63 | 3.50 | 3.24 | 3.23 | 3.29 | 3.37 | 3.40 | 3.35 | 3.33 | 3.33 | 3.33 | 3.39 |
| 1862.. | 3.33 | 3.33 | 3.11 | 2.78 | 2.78 | 3.64 | 4.58 | 4.85 | 4.98 | 5.22 | 5.50 | 5.63 | 4.14 |
| 1863.. | 5.38 | 5.25 | 4.63 | 4.75 | 5.50 | 5.80 | 6.25 | 6.50 | 6.75 | 7.25 | 7.50 | 7.13 | 6.06 |
| 1864.. | 7.10 | 6.75 | 6.59 | 7.20 | 7.88 | 8.34 | 9.78 | 10.75 | 10.13 | 8.90 | 8.88 | 8.38 | 8.39 |
| 1865.. | 8.38 | 8.38 | 8.63 | 8.10 | 6.75 | 6.25 | 6.03 | 6.50 | 8.32 | 9.93 | 8.81 | 8.25 | 7.86 |
| 1866.. | 7.94 | 7.75 | 5.40 | 5.25 | 5.13 | 5.53 | 5.88 | 5.68 | 5.47 | 5.34 | 5.25 | 5.05 | 5.80 |
| 1867.. | 5.06 | 5.06 | 4.47 | 4.50 | 4.44 | 4.38 | 4.28 | 4.07 | 4.09 | 4.01 | 4.00 | 4.00 | 4.37 |
| 1868.. | 4.00 | 3.13 | 3.13 | 3.22 | 3.25 | 3.25 | 3.25 | 3.25 | 4.10 | 4.50 | 5.22 | 6.00 | 3.86 |
| 1869.. | 5.15 | 5.01 | 4.15 | 3.81 | 3.90 | 5.00 | 6.59 | 7.17 | 6.15 | 6.00 | 5.87 | 5.12 | 5.31 |
| 1870.. | 5.07 | 4.79 | 4.79 | 4.50 | 4.50 | 4.44 | 4.31 | 4.44 | 4.33 | 4.19 | 3.69 | 3.55 | 4.39 |
| 1871.. | 4.05 | ..... | ..... | ..... | ..... | 4.52 | 4.45 | 4.25 | 4.35 | 4.68 | 4.72 | 4.63 | 4.46 |
| 1872.. | 4.63 | 3.78 | 3.50 | 3.50 | 3.50 | 3.50 | 3.50 | 3.59 | 3.71 | 3.90 | 3.90 | 3.90 | 3.74 |
| 1873.. | 3.90 | 3.90 | 4.00 | 4.00 | 4.10 | 4.20 | 4.40 | 4.40 | 4.50 | 4.60 | 4.60 | 4.60 | 4.27 |
| 1874.. | ..... | ..... | 4.05 | 4.10 | 4.20 | 4.30 | 4.45 | 4.60 | 4.75 | 4.90 | 5.05 | 5.05 | 4.55 |
| 1875.. | ..... | ..... | 4.10 | 4.10 | 4.10 | 4.40 | 4.50 | 4.50 | 4.55 | 4.55 | 4.55 | 4.55 | 4.39 |
| 1876.. | 4.55 | 4.15 | 4.25 | 4.25 | 4.30 | 4.15 | 4.20 | 4.35 | 3.20 | 3.00 | 3.00 | 3.00 | 3.87 |
| 1877.. | 3.00 | 3.00 | 2.75 | 2.75 | 2.75 | 2.40 | 2.47 | 2.40 | 2.40 | 2.35 | 2.35 | 2.40 | 2.59 |
| 1878.. | 3.25 | 3.50 | 3.25 | 3.25 | 3.25 | 3.30 | 3.30 | 3.30 | 3.30 | 3.30 | 3.05 | 2.50 | 3.22 |
| 1879.. | 2.50 | 2.50 | 2.25 | 2.25 | 2.50 | 2.50 | 2.50 | 2.75 | 2.75 | 3.00 | 3.25 | 3.65 | 2.70 |
| 1880.. | 3.90 | 4.25 | 4.35 | 4.65 | 4.65 | 4.65 | 4.65 | 4.65 | 4.65 | 4.65 | 4.65 | 4.65 | 4.53 |
| 1881.. | 4.65 | 4.65 | 4.58 | 4.50 | 4.50 | 4.50 | 4.50 | 4.50 | 4.50 | 4.50 | 4.50 | 4.50 | 4.53 |
| 1882.. | 4.50 | 4.50 | 4.50 | 4.50 | 4.50 | 4.50 | 4.65 | 4.75 | 4.75 | 4.75 | 4.75 | 4.75 | 4.61 |
| 1883.. | 4.75 | 4.75 | 4.50 | 4.50 | 4.50 | 4.50 | 4.50 | 4.50 | 4.50 | 4.50 | 4.50 | 4.50 | 4.54 |
| 1884.. | 4.50 | 4.50 | 4.40 | 4.40 | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |

PRICES OF LEHIGH COAL IN PHILADELPHIA. (From Grotjan's *Public Sale Report.*) 1822 May to December, $8.40. 1823, January to August, $10; September, $9.50; October to December, $8.40. 1824, January to April, $8.40.

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## THE ANTHRACITE COAL PRODUCTION OF PENNSYLVANIA.

*Prepared from original and authentic statistics by John H. Jones, Philadelphia.*

| YEARS. | THE WYOMING REGION. | | THE LEHIGH REGION. | | THE SCHUYLKILL REGION. | | TOTAL. |
|---|---|---|---|---|---|---|---|
| | Gross tons. | Per cent. | Gross tons. | Per cent. | Gross tons. | Per cent. | Gross tons. |
| 1820 | ..... | ..... | 365 | ..... | ..... | ..... | 365 |
| 1821 | ..... | ..... | 1,073 | ..... | ..... | ..... | 1,073 |
| 1822 | ..... | ..... | 2,240 | 60.21 | 1,480 | 39.79 | 3,720 |
| 1823 | ..... | ..... | 5,823 | 83.77 | 1,128 | 16.23 | 6,951 |
| 1824 | ..... | ..... | 9,541 | 85.90 | 1,567 | 14.10 | 11,108 |
| 1825 | ..... | ..... | 28,393 | 81.40 | 6,500 | 18.60 | 34,893 |
| 1826 | ..... | ..... | 31,280 | 65.10 | 16,767 | 34.90 | 48,047 |
| 1827 | ..... | ..... | 32,074 | 50.56 | 31,360 | 49.44 | 63,434 |
| 1828 | ..... | ..... | 30,232 | 39.00 | 47,284 | 61.00 | 77,516 |
| 1829 | 7,000 | 6.25 | 25,110 | 22.40 | 79,973 | 71.35 | 112,083 |
| 1830 | 43,000 | 24.60 | 41,750 | 23.90 | 89,984 | 51.50 | 174,734 |
| 1831 | 54,000 | 30.54 | 40,966 | 23.17 | 81,854 | 46.29 | 176,820 |
| 1832 | 84,000 | 23.12 | 70,000 | 19.27 | 209,271 | 57.61 | 363,271 |
| 1833 | 111,777 | 22.91 | 123,001 | 25.22 | 252,971 | 51.87 | 487,749 |
| 1834 | 43,700 | 11.60 | 106,244 | 28.21 | 226,692 | 60.19 | 376,636 |
| 1835 | 90,000 | 16.05 | 131,250 | 23.41 | 339,508 | 60.54 | 560,758 |
| 1836 | 103,861 | 15.18 | 148,211 | 21.66 | 432,045 | 63.16 | 684,117 |
| 1837 | 115,387 | 13.27 | 223,902 | 25.75 | 530,152 | 60.98 | 869,441 |
| 1838 | 78,207 | 10.59 | 213,615 | 28.92 | 446,875 | 60.49 | 738,697 |
| 1839 | 122,300 | 14.94 | 221,025 | 27.01 | 475,077 | 58.05 | 818,402 |
| 1840 | 148,470 | 17.18 | 225,313 | 26.07 | 490,596 | 56.75 | 864,379 |
| 1841 | 192,270 | 20.03 | 143,037 | 14.90 | 624,466 | 65.07 | 959,773 |
| 1842 | 252,599 | 22.79 | 272,540 | 24.59 | 583,273 | 52.62 | 1,108,412 |
| 1843 | 285,605 | 22.60 | 267,793 | 21.19 | 710,200 | 56.21 | 1,263,598 |
| 1844 | 365,911 | 22.43 | 377,002 | 23.12 | 887,937 | 54.45 | 1,630,850 |
| 1845 | 451,836 | 22.45 | 429,453 | 21.33 | 1,131,724 | 56.22 | 2,013,013 |
| 1846 | 518,389 | 22.11 | 517,116 | 22.07 | 1,308,500 | 55.82 | 2,344,005 |
| 1847 | 583,067 | 20.23 | 633,507 | 21.98 | 1,665,735 | 57.79 | 2,882,309 |
| 1848 | 685,196 | 22.18 | 670,321 | 21.70 | 1,733,721 | 56.12 | 3,089,288 |
| 1849 | 732,910 | 22.60 | 781,556 | 24.10 | 1,728,500 | 53.30 | 3,242,966 |
| 1850 | 827,823 | 24.64 | 690,456 | 20.56 | 1,840,020 | 54.80 | 3,358,899 |
| 1851 | 1,156,167 | 25.98 | 964,224 | 21.68 | 2,328,525 | 52.34 | 4,448,916 |
| 1852 | 1,284,500 | 25.72 | 1,072,136 | 21.47 | 2,636,835 | 52.81 | 4,993,471 |
| 1853 | 1,475,732 | 28.41 | 1,054,309 | 20.29 | 2,665,110 | 51.30 | 5,195,151 |
| 1854 | 1,603,478 | 26.73 | 1,207,186 | 20.13 | 3,191,670 | 53.14 | 6,002,334 |
| 1855 | 1,771,511 | 26.80 | 1,284,113 | 19.43 | 3,552,943 | 53.77 | 6,608,567 |
| 1856 | 1,972,581 | 28.47 | 1,351,970 | 19.52 | 3,602,999 | 52.91 | 6,927,550 |
| 1857 | 1,952,603 | 29.39 | 1,318,541 | 19.84 | 3,373,797 | 50.77 | 6,644,941 |
| 1858 | 2,186,094 | 31.96 | 1,380,030 | 20.18 | 3,273,245 | 47.86 | 6,839,369 |
| 1859 | 2,731,236 | 34.98 | 1,628,311 | 20.86 | 3,448,708 | 44.16 | 7,808,255 |
| 1860 | 2,941,817 | 34.56 | 1,821,674 | 21.40 | 3,749,632 | 44.04 | 8,513,123 |
| 1861 | 3,055,140 | 38.41 | 1,738,377 | 21.85 | 3,160,747 | 39.74 | 7,954,264 |
| 1862 | 3,145,770 | 39.97 | 1,351,054 | 17.17 | 3,372,583 | 42.86 | 7,869,407 |
| 1863 | 3,759,610 | 39.30 | 1,894,713 | 19.80 | 3,911,683 | 40.90 | 9,566,006 |
| 1864 | 3,960,836 | 38.92 | 2,054,669 | 20.19 | 4,161,970 | 40.89 | 10,177,475 |
| 1865 | 3,254,519 | 33.72 | 2,040,913 | 21.14 | 4,356,959 | 45.14 | 9,652,391 |
| 1866 | 4,736,616 | 37.29 | 2,179,364 | 17.15 | 5,787,902 | 45.56 | 12,703,882 |
| 1867 | 5,325,000 | 40.99 | 2,502,054 | 19.27 | 5,161,671 | 39.74 | 12,988,725 |
| 1868 | 5,968,146 | 43.25 | 2,502,582 | 18.13 | 5,330,737 | 38.62 | 13,801,465 |
| 1869 | 6,141,369 | 44.28 | 1,949,673 | 14.06 | 5,775,138 | 41.66 | 13,866,180 |
| 1870 | 7,974,660 | 49.28 | 3,239,374 | 20.02 | 4,968,157 | 30.70 | 16,182,191 |
| 1871 | 6,911,242 | 44.02 | 2,235,707 | 14.24 | 6,552,772 | 41.74 | 15,699,721 |
| 1872 | 9,101,549 | 46.27 | 3,873,339 | 19.70 | 6,694,890 | 34.03 | 19,669,778 |
| 1873 | 10,309,755 | 48.57 | 3,705,596 | 17.46 | 7,212,601 | 33.97 | 21,227,952 |
| 1874 | 9,504,408 | 47.18 | 3,773,836 | 18.73 | 6,866,877 | 34.09 | 20,145,121 |
| 1875 | 10,596,155 | 53.75 | 2,834,605 | 14.38 | 6,281,712 | 31.87 | 19,712,472 |
| 1876 | 8,424,158 | 45.53 | 3,854,919 | 20.84 | 6,221,934 | 33.63 | 18,501,011 |
| 1877 | 8,300,377 | 39.85 | 4,332,760 | 20.80 | 8,195,042 | 39.35 | 20,828,179 |
| 1878 | 8,085,587 | 45.92 | 3,237,449 | 18.40 | 6,282,226 | 35.68 | 17,605,262 |
| 1879 | 12,586,293 | 48.14 | 4,595,567 | 17.58 | 8,960,829 | 34.28 | 26,142,689 |
| 1880 | 11,419,279 | 48.72 | 4,463,221 | 19.05 | 7,554,742 | 32.23 | 23,437,242 |
| 1881 | 13,951,383 | 48.96 | 5,294,676 | 18.58 | 9,253,958 | 32.46 | 28,500,017 |
| 1882 | 13,971,371 | 47.98 | 5,689,437 | 19.54 | 9,459,288 | 32.48 | 29,120,096 |
| 1883 | 15,604,492 | 49.08 | 6,113,809 | 19.23 | 10,074,726 | 31.69 | 31,793,027 |

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# IMPORTS OF IRON AND STEEL AND MANUFACTURES THEREOF INTO THE UNITED STATES FROM ALL COUNTRIES DURING THE CALENDAR YEARS 1880, 1881, 1882, AND 1883.

(GOLD VALUES.)

*Prepared from statistics furnished by the United States Bureau of Statistics.*

| COMMODITIES. | 1880. | | 1881. | | 1882. | | 1883. | |
|---|---|---|---|---|---|---|---|---|
| | Net tons. | Values. | Net tons. | Values. | Net tons. | Values. | Net tons. | Values. |
| Pig iron | 784,968 | $14,998,212 | 520,835 | $8,923,465 | 604,978 | $9,896,669 | 361,366 | $5,745,999 |
| Castings | 114 | 6,806 | 632 | 37,625 | 2,079 | 115,691 | ..... | ..... * ..... |
| Bar iron | 126,987 | 5,721,828 | 47,820 | 2,075,161 | 79,220 | 3,304,967 | 47,409 | 1,914,474 |
| Band, hoop, and scroll iron | 25,322 | 1,032,026 | 827 | 28,296 | 6,021 | 208,825 | 1,003 | 39,436 |
| Railroad bars, of iron | 132,459 | 4,094,550 | 137,013 | 3,464,989 | 41,992 | 1,077,059 | 757 | 21,231 |
| Railroad bars, of steel | 158,230 | 5,098,351 | 249,308 | 7,649,498 | 182,135 | 5,403,980 | 38,220 | 1,047,609 |
| Sheet, plate, and taggers iron | 11,580 | 951,486 | 8,411 | 623,534 | 13,160 | 806,648 | 9,114 | 684,315 |
| Old and scrap iron | 694,273 | 14,704,879 | 151,107 | 2,705,072 | 164,591 | 2,736,483 | 72,000 | 1,014,863 |
| Anchors, cables, and chains | 1,393 | 140,808 | 1,520 | 134,390 | 1,530 | 142,108 | ..... | ..... * ..... |
| Hardware | ..... | 116,253 | ..... | 84,013 | ..... | 77,966 | ..... | ..... * ..... |
| Machinery | ..... | 1,601,523 | ..... | 1,739,486 | ..... | 2,275,753 | ..... | 1,685,370 |
| Fire-arms | ..... | 1,083,305 | ..... | 1,334,004 | ..... | 1,656,349 | ..... | 1,258,940 |
| Steel ingots, bars, sheets, and wire | ..... | 5,583,363 | ..... | 9,949,918 | ..... | 12,990,233 | ..... | ..... * ..... |
| Cutlery | ..... | 1,894,675 | ..... | 1,954,317 | ..... | 2,027,496 | ..... | 2,061,603 |
| Files | ..... | 159,817 | ..... | 168,506 | ..... | 169,885 | ..... | ..... * ..... |
| Saws and tools | ..... | 5,862 | ..... | 24,205 | ..... | 32,775 | ..... | ..... * ..... |
| Tinplates, terne plates, etc | 177,015 | 16,478,110 | 204,966 | 14,886,907 | 239,665 | 17,975,161 | 247,781 | 18,156,773 |
| Other manufactures | ..... | 6,771,508 | ..... | 5,771,691 | ..... | 6,177,077 | ..... | 13,875,693 |
| Total | 2,112,341 | $80,443,362 | 1,322,439 | $61,555,077 | 1,335,371 | $67,075,125 | 777,650 | $47,506,306 |

* Included in "other manufactures."

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## DOMESTIC EXPORTS OF IRON AND STEEL AND MANUFACTURES THEREOF FROM THE UNITED STATES TO ALL COUNTRIES DURING THE CALENDAR YEARS 1881, 1882, AND 1883.—GOLD VALUES.

*Prepared from statistics furnished by the United States Bureau of Statistics.*

| COMMODITIES. | 1881. | | 1882. | | 1883. | |
|---|---|---|---|---|---|---|
| | Quantities. | Values. | Quantities. | Values. | Quantities. | Values. |
| **IRON AND MANUFACTURES OF:** | | | | | | |
| Pig iron.....Net tons. | 6,897 | $184,364 | 6,245 | $186,221 | 4,221 | $111,414 |
| Bar iron..... " | 448 | 32,325 | 847 | 60,628 | 1,201 | 72,054 |
| Railroad bars or rails..... " | 597 | 34,262 | 2,518 | 126,878 | 579 | 31,806 |
| Band, hoop, scroll, plate, and sheet iron..... " | 184 | 14,473 | 163 | 14,962 | 330 | 29,187 |
| Castings, not specified..... | ..... | 288,005 | ..... | 378,884 | ..... | 385,262 |
| Car-wheels.....No. | 13,643 | 139,222 | 14,370 | 149,320 | 18,217 | 181,236 |
| Stoves, and parts of..... | ..... | 142,097 | ..... | 213,158 | ..... | 232,713 |
| Steam-engines, locomotives.....No. | 104 | 913,952 | 174 | 1,878,528 | 275 | 2,650,944 |
| Steam-engines, stationary..... " | 94 | 88,158 | 104 | 183,211 | 147 | 170,104 |
| Boilers, separate from engines..... | ..... | 161,121 | ..... | 189,413 | ..... | 290,177 |
| Machinery, not specified..... | ..... | 4,817,698 | ..... | 6,129,244 | ..... | 5,935,543 |
| Printing presses, and parts of..... | ..... | 195,261 | ..... | 215,619 | ..... | 250,407 |
| Nails and spikes.....Net tons. | 4,577 | 312,059 | 4,053 | 320,753 | 5,724 | 388,070 |
| All other manufactures of iron..... | ..... | 5,571,001 | ..... | 6,274,604 | ..... | 5,289,607 |
| **STEEL AND MANUFACTURES OF:** | | | | | | |
| Ingots, bars, sheets, and rods.....Net tons. | 235 | 46,457 | 501 | 89,076 | 275 | 54,350 |
| Cutlery..... | ..... | 96,552 | ..... | 91,994 | ..... | 103,732 |
| Saws and tools..... | ..... | 1,157,511 | ..... | 1,065,242 | ..... | 1,388,562 |
| Fire-arms..... | ..... | 1,018,471 | ..... | 927,180 | ..... | 1,357,686 |
| Railroad bars or rails.....Net tons. | 87 | 7,123 | 1,088 | 81,350 | 2,006 | 102,864 |
| All other manufactures of steel..... | ..... | 562,090 | ..... | 453,494 | ..... | *..... |
| **Total exports of iron and steel** ..... | ..... | $15,782,202 | ..... | $19,029,759 | ..... | 19,025,718 |
| **AGRICULTURAL IMPLEMENTS:** | | | | | | |
| Horse-powers.....No. | 37 | $9,065 | 61 | $20,350 | ..... | $38,471 |
| Mowers and reapers..... " | 6,210 | 656,274 | 11,420 | 1,127,925 | ..... | 1,755,232 |
| Plows and cultivators..... " | 21,245 | 180,239 | 35,564 | 335,643 | ..... | 396,926 |
| All others not specified..... | ..... | 1,576,258 | ..... | 1,943,321 | ..... | 1,499,280 |
| SCALES AND BALANCES..... | ..... | 234,777 | ..... | 315,898 | ..... | 319,041 |
| SEWING-MACHINES..... | ..... | 2,179,770 | ..... | 2,975,616 | ..... | 3,362,971 |
| FIRE-ENGINES AND APPARATUS..... | ..... | 19,372 | ..... | 27,561 | ..... | 8,310 |
| **Total agricultural implements, etc**..... | ..... | $4,855,755 | ..... | $6,746,314 | ..... | $7,380,231 |

* Included in "all other manufactures of iron."

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## GRAND SUMMARY OF UNITED STATES STATISTICS FOR 1883.

| | |
|---|---|
| Production of Pig Iron in 1883, net tons | 5,146,972 |
| Production of Spiegeleisen in 1883, (included in Pig Iron,) net tons | 24,574 |
| Production of all Rolled Iron, including Nails and excluding Rails, in 1883, net tons | 2,283,920 |
| Production of Cut Nails and Spikes in 1883, included in all Rolled Iron, kegs of 100 pounds | 7,762,737 |
| Production of Bessemer Steel Rails in 1883, net tons | 1,286,554 |
| Production of Open-hearth Steel Rails in 1883, net tons | 9,186 |
| Production of Iron Rails in 1883, net tons | 64,954 |
| Total production of Rails in 1883, net tons | 1,360,694 |
| Production of Iron and Steel Street Rails in 1883, (included above,) net tons | 19,440 |
| Production of Crucible Steel Ingots in 1883, net tons | 80,455 |
| Production of Open-hearth Steel Ingots in 1883, net tons | 133,679 |
| Production of Bessemer Steel Ingots in 1883, net tons | 1,654,627 |
| Production of Blister and "Patented" Steel in 1883, net tons | 5,598 |
| Production of all kinds of Steel in 1883, net tons | 1,874,359 |
| Production of Blooms from Ore and Pig Iron in 1883, net tons | 74,758 |
| Value of Imports of Iron and Steel in 1883 | $47,506,306 |
| Value of Exports of Iron and Steel in 1883 | $19,025,718 |
| Imports of Iron Ore in 1883, gross tons | 490,875 |
| Production of Lake Superior Iron Ore in 1883, gross tons | 2,352,889 |
| Production of Iron Ore in New Jersey in 1883, gross tons | 521,416 |
| Production of Anthracite Coal in 1883, gross tons | 31,793,027 |
| Total Production of Coal in 1883, gross tons | 96,159,719 |
| Miles of Railway Completed in 1883 | 6,500 |
| Total number of Miles of Railway December 31, 1883, | 121,425 |
| Iron Ships Built in the fiscal year ended June 30, 1883 | 35 |
| Immigrants in the calendar year 1883 | 570,316 |
| Net Imports (merchandise) in the fiscal year 1883 | $703,565,144 |
| Domestic Exports (merchandise) in the fiscal year 1883 | $804,223,632 |
| Net Imports (mdse.) first 8 months of fiscal year 1884 | $434,076,372 |
| Domestic Exports (mdse.) first 8 months of fiscal year 1884. | $522,310,444 |

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# THE MANUFACTURE OF ROLLED IRON IN PENNSYLVANIA IN 1880, 1881, 1882, AND 1883, BY DISTRICTS.

In the following table the Philadelphia district covers Philadelphia county and the Pencoyd Iron Works; Eastern Pennsylvania comprises the eastern counties outside of the Philadelphia district as far west as the limits of Chester, Berks, Schuylkill, and Carbon counties; Central Pennsylvania comprises the counties west of those just named, extending to the western limits of Bedford, Blair, Centre, and Clinton counties; Western Pennsylvania comprises all counties west of those just named, except Allegheny county, which is a separate district.

BAR, ROD, BOLT, SKELP, HOOP, AND SHAPED IRON, AND ROLLED AXLES.

| Districts. | Net tons of 2,000 pounds. | | | |
|---|---|---|---|---|
| | 1880. | 1881. | 1882. | 1883. |
| Philadelphia | 52,134 | 67,695 | 75,180 | 70,819 |
| Eastern Pennsylvania, except Phila. | 96,507 | 107,968 | 128,221 | 113,539 |
| Central Pennsylvania | 59,274 | 78,610 | 100,800 | 89,496 |
| Allegheny County | 283,600 | 400,801 | 332,309 | 366,507 |
| Western Pa., except Allegheny Co. | 59,787 | 59,039 | 48,539 | 34,865 |
| Total | 551,302 | 714,113 | 685,049 | 675,226 |

PLATE AND SHEET IRON, EXCEPT NAIL PLATE.

| | | | | |
|---|---|---|---|---|
| Philadelphia | 7,570 | 12,221 | 9,428 | 9,139 |
| Eastern Pennsylvania, except Phila. | 105,746 | 122,997 | 132,906 | 116,067 |
| Central Pennsylvania | 17,516 | 22,021 | 27,536 | 33,070 |
| Allegheny County | 80,899 | 75,767 | 71,038 | 73,850 |
| Western Pa., except Allegheny Co. | 12,209 | 18,219 | 17,695 | 22,320 |
| Total | 223,940 | 251,225 | 258,603 | 254,446 |

CUT NAILS AND SPIKES.

| | | | | |
|---|---|---|---|---|
| Eastern Pa., including Phila. | 23,248 | 22,533 | 26,368 | 25,596 |
| Central Pennsylvania | 30,604 | 34,044 | 37,072 | 50,606 |
| Allegheny County | 20,955 | 24,296 | 22,961 | 31,395 |
| Western Pa., except Allegheny Co. | 12,071 | 14,862 | 11,069 | 13,931 |
| Total | 86,878 | 95,735 | 97,470 | 121,528 |

IRON RAILS.

| | | | | |
|---|---|---|---|---|
| Philadelphia | ..... | ..... | ..... | ..... |
| Eastern Pennsylvania | 66,632 | 67,929 | 26,756 | 13,964 |
| Central Pennsylvania | 64,270 | 81,961 | 44,269 | 14,475 |
| Allegheny County | 3,653 | 4,318 | 4,319 | 599 |
| Western Pa., except Allegheny Co. | 35,927 | 39,585 | 7,420 | 925 |
| Total | 170,482 | 193,793 | 82,764 | 29,963 |

TOTAL ROLLED IRON.

| | | | | |
|---|---|---|---|---|
| Philadelphia | 61,653 | 82,505 | 86,908 | 82,903 |
| Eastern Pennsylvania, except Phila. | 290,184 | 318,838 | 311,951 | 266,221 |
| Central Pennsylvania | 171,664 | 216,636 | 209,677 | 187,647 |
| Allegheny County | 389,107 | 505,182 | 430,627 | 472,351 |
| Western Pa., except Allegheny Co. | 119,994 | 131,705 | 84,723 | 72,041 |
| Total | 1,032,602 | 1,254,866 | 1,123,886 | 1,081,163 |

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## THE MANUFACTURE OF ROLLED IRON IN OHIO IN 1880, 1881, 1882, AND 1883, BY DISTRICTS.

IN the following table the Lake Counties are those bordering on Lake Erie; the Mahoning Valley comprises the counties in the northeastern part of Ohio; the Interior Counties cover the counties south and west of the two first-named districts, except the counties along the Ohio river, which are classed in a district by themselves.

BAR, ROD, BOLT, SKELP, HOOP, AND SHAPED IRON, AND ROLLED AXLES.

| DISTRICTS. | Net tons of 2,000 pounds. | | | |
|---|---|---|---|---|
| | 1880. | 1881. | 1882. | 1883. |
| Lake Counties | 19,787 | 31,744 | 40,359 | 47,912 |
| Mahoning Valley | 111,271 | 132,986 | 128,466 | 140,875 |
| Interior Counties | 23,328 | 30,733 | 37,182 | 28,905 |
| Ohio River Counties | 28,291 | 33,784 | 47,926 | 45,555 |
| Total | 182,677 | 229,247 | 253,933 | 263,247 |

PLATE AND SHEET IRON, EXCEPT NAIL PLATE.

| | | | | |
|---|---|---|---|---|
| Lake Counties | 12,014 | 16,123 | 15,021 | 15,956 |
| Mahoning Valley | 10,321 | 10,689 | 10,813 | 7,238 |
| Interior Counties | ..... | ..... | ..... | 140 |
| Ohio River Counties | 11,491 | 10,515 | 23,348 | 26,653 |
| Total | 33,826 | 37,327 | 49,182 | 49,987 |

CUT NAILS AND SPIKES.

| | | | | |
|---|---|---|---|---|
| Lake Counties | ..... | ..... | ..... | ..... |
| Mahoning Valley | 9,219 | 10,082 | 8,130 | 8,977 |
| Interior Counties | ..... | ..... | ..... | ..... |
| Ohio River Counties | 32,015 | 32,951 | 31,713 | 53,508 |
| Total | 41,234 | 43,033 | 39,843 | 62,485 |

IRON RAILS.

| | | | | |
|---|---|---|---|---|
| Lake Counties | 31,001 | 17,500 | 6,368 | 850 |
| Mahoning Valley | ..... | ..... | ..... | ..... |
| Interior Counties | 19,066 | 18,376 | 11,431 | 494 |
| Ohio River Counties | 762 | 244 | 851 | 899 |
| Total | 50,829 | 36,120 | 18,650 | 2,243 |

TOTAL ROLLED IRON.

| | | | | |
|---|---|---|---|---|
| Lake Counties | 62,802 | 65,367 | 61,748 | 64,718 |
| Mahoning Valley | 130,811 | 153,757 | 147,409 | 157,090 |
| Interior Counties | 42,394 | 49,109 | 48,613 | 29,539 |
| Ohio River Counties | 72,559 | 77,494 | 103,838 | 126,615 |
| Total | 308,566 | 345,727 | 361,608 | 377,962 |

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# STATISTICS OF THE FOREIGN IRON TRADE FOR 1883.

—

GENERAL SUMMARY FOR 1883 AND FOR PART OF 1884.

THE tendency to restricted consumption and lower prices of iron and steel which was so marked in the United States in 1883 and in the early months of the present year was reflected in the course of the iron and steel industries of Europe during the same period—not in all European countries in a uniform degree, but in all of them in some degree. The causes, however, were not entirely the same there as here. In this country we have had a natural reaction from extraordinary activity, a great shrinkage in the building of railroads, and a capacity for the production of iron and steel that has been in excess of the country's wants and that has brought low and still lower prices. In Europe there has been the same natural reaction and the same excess of capacity over demand, but there has been no notable decline in railroad building. In Great Britain, which produces as much iron and steel as all the rest of Europe, there has been a cessation of the abnormal demand from the United States for iron and steel which began in 1879 and only recently came to an end, and there has also been in the same country an over-production of iron ships. Since the beginning of the present year the dullness in the European iron trade, especially in that of Great Britain, has become more and more pronounced, and to-day the taunt of over-production because of our protective tariff that has of late so frequently come to us from beyond the Atlantic is heard only from *doctrinaires* in our own country. There is over-production of iron and steel and of other manufactured products in Europe, and it is frankly admitted by European journals and set forth in the reports of American consuls.

In the well-known technical journal, *Iron*, published at London, we read as follows under date of December 28, 1883: "Trade closes very badly in the Continental iron markets for the year. In Belgium pig iron is still falling, and finished iron is following in its wake. Instead of improving, matters in the French iron market



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are growing worse. There is no increase in the number of orders, which continue to be given out very sparingly. Values are fluctuating. The German market is heavy, and prices are weak." Under date of January 4th of the present year we read in the same journal:

"In looking back upon the course of the iron trade of the Continent during the past year we are struck by the absence of any satisfactory feature. The year 1883 will be remembered on the Continent as the beginning of another cycle of depression, for it does not require much foresight to perceive that we have not yet arrived at that point in its condition in which a reaction for the better is likely to set in. The causes of the depression are not far to seek. The root of the evil is, in the first place, over-production, for, whatever may be said to the contrary, there has been a steady demand throughout the year, which only began to slacken when the effects of that excess of production made themselves felt. But it is equally apparent that the competition to which the iron manufacturers of the Continent were subjected by the large quantities of English iron thrown upon its markets, induced by the low prices to which products had been reduced in England through the self-same over-production, was another factor in the depression of the Continental trade. Both cause and effect prove that the English iron market is still the ruling market in Europe, if not in the world. Contrary to the experiences of 1882, during which the iron trade of the Continent progressed on a sound basis, the year just closed has been one of a steady decline in values in all the iron-producing countries of Europe."

In presenting details *Iron* says of Germany: "More than that of any other country, the iron industry of Germany is subject to the influence of the English market; and, as the unfavorable condition of the latter during the past year has been deepening in intensity, that of Germany, and notably that of Westphalia, has felt the changes and depression of the English iron market. English competition is the great bugbear of German manufacturers, and not without just cause. A decreasing demand and, on the face of it, an increasing production were two factors contributing greatly towards depression." Of France it says: "There can be no doubt that, protected as France is by high duties, protection has not enabled her iron manufacturers to battle against the general depression in the iron trade. The decline in the value of all kinds of iron is unmistakable, pig iron having fallen about 10 francs per ton, whilst manufactured iron has lost quite 20 francs on the year. This is very remarkable, considering that France exports but very little, nearly all her iron manufactures being consumed at home."

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Of Belgium: "Throughout the year the downward course of prices of manufactured iron was uninterrupted, and depression grew as the year lengthened. Towards the middle of the year pig iron also began to give way, and at its close it was fully 7 francs below its quotation at its beginning, whilst English foundry pig fell as much as 9 francs per ton. On November 15th Belgian forgemasters were compelled to reduce the wages of ironworkers 10 per cent., the men not uttering a single protest. At the same time many works began to discharge their workmen, both in the Liége and Charleroi districts. The year closed very gloomy." Of Sweden: "The Swedish iron trade has been in a far less satisfactory state in 1883 than in 1882, and the past year closed with lower prices and a more limited demand than has been the case for some years. This is no doubt caused by over-production." Of Austria it gives a more favorable account: "On the whole the past year has been one of uninterrupted activity in the Austrian iron trade. By the middle of the year full rates were still obtained for all classes of iron and steel, and at the end of August matters looked as well as ever. But prices were kept in check, to some extent, by the successful competition of other countries, especially Germany, whose manufacturers were able, notwithstanding a prohibitive tariff, to throw large quantities of iron upon the Austrian market. The persistent decline in the demand in foreign markets had the effect of increasing those imports, and thus exerting a depressing influence upon values in Austria. The dull tone prevailing abroad spread also to Austria, and the market gradually assumed a flat tone, with the inevitable consequence of a fall in prices, which became distinctly pronounced at the beginning of November, and has continued to the end of the year."

Concerning the course of the British iron trade in 1883 the same excellent authority from which we have just quoted says: "The year which has just closed upon us can not be considered as having proved a satisfactory one to the iron and steel trades of this country. Its opening was marked by a feeling pervading all branches much less sanguine than had been experienced during preceding years, and its close has been characterized by a depression only less pronounced than that which prevailed prior to the revival that set in about the middle of 1879. The decline in prices was steady, and may be said to have been uninterrupted, any little momentary rise which may have occurred having been only as a ripple upon the receding tide. But it was more pronounced, in the majority of

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cases, towards the latter end of the year than during the early months, when people still continued to indulge a hope that as the year wore on a change for the better might come over the iron trade." *The Economist*, of London, for January 12, 1884, says: "A review of the iron trade during 1883 is in every respect unsatisfactory, for not only has there been a general fall in prices, but the volume of business appears to have been steadily diminishing, and the outlook at the close of the year was most unpromising. The fall in prices, though not very rapid, was spread over the whole of the year, but was more pronounced during the last quarter. The reason for this backward movement is not difficult to discover. The abnormal activity of 1879–1882 had worn itself out, and the reaction has been partially manifest in 1883; but it would be rash to say that this reaction has by any means exhausted itself." At the close of December, 1883, the London *Times* said of the British iron trade: "The year now closing has been one of general disappointment in the iron and steel trades of the United Kingdom, with the exception perhaps of the shipbuilding department. In our review of the iron trade last year we foreshadowed an over-production for 1883, and this has been verified. The values of all the leading articles have slowly but steadily declined. The comparison of prices is as follows: Scotch pig iron, 1st January 49s. per ton, to-day 43s. 8d. per ton; hematite pig iron, 1st January 53s. per ton, to-day 46s. per ton; steel rails, 1st January £5 per ton, to-day £4 5s. per ton; ship plates, 1st January £6 10s. per ton, to-day £5 10s. per ton." On the 30th of November last General E. A. Merritt, the consul-general of the United States at London, officially reported to our State Department as follows: "The existing depression in the great industries devoted to iron, steel, and coal presents a discouraging outlook for the future. In many localities laborers are working at starvation wages as a matter of necessity, while employers are calculating losses rather than gains. The laborers in these industries are at this juncture demanding an increase of 15 per cent., which the employers decline to accede to, claiming that they have been losing money for the past year, even at present prices." At the close of 1883 there were 506 furnaces in blast in Great Britain, against 565 at the close of 1882—a decrease of 59. The whole number of furnaces out of blast in Great Britain at the close of 1883 was 398.

In April last the condition of the British iron trade was worse than at the beginning of the year. *The Statist* for April 5th says:

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"The first quarter of the year has come and gone, but it has brought no relief from the depression which has so long hung over the iron trade. On the contrary, matters have gone from bad to worse, and it is difficult to say whether the worst has yet been reached. The volume of trade is manifestly diminished." *The Economist* for April 12th says: "The first quarter of the year has passed without bringing any relief to the long-afflicted iron trade. The accounts from all districts are very unsatisfactory. The North of England is perhaps suffering the most, on account of its great dependence on shipbuilding." The depression which has taken place in the iron shipbuilding industry of Great Britain and the causes of it are set forth in the following cable dispatches:

LONDON, April 12.—The depression in English shipping has become extreme. The ports are crowded with destitute and suffering sailors. In Shields alone there are 4,000 seamen out of employment. A hundred steamers are lying idle upon the Tyne. Ten thousand laborers in the Tyne shipyards are out of work, and as many more in the Sunderland shipyards. Business is slack in the yards along the Clyde, but so far there has been less suffering than in the other shipbuilding localities.

LONDON, April 19.—There has been no improvement during the past week in the condition of shipping. The depression amounts almost to a paralysis, and the destitution and suffering of unemployed men is on the increase. Public subscriptions are being organized at Newcastle-on-Tyne, at Liverpool, at Shields, and at Sunderland for the men.

GLASGOW, April 29.—The wages of shipbuilders on the Clyde are reduced to-day 10 per cent. Twelve thousand men are idle.

Ryland's *Iron Trade Circular* for May 3d, published at Birmingham, says of the condition of the British iron trade at that date: "The iron trade continues dull and sluggish, and the tendency is still downward. The week has not produced any decided fall except at Glasgow, where warrants have declined 6d. per ton, but the whole feeling of the trade is languid, and one sees indications all round of further reductions gradually taking place. The volume of business doing is so small and there is such an absence of ordinary large transactions that it is difficult with exactitude to state what the lowest prices are at which iron is changing hands."

The iron trade on the Continent has experienced no improvement in prices since the beginning of the present year, but production has not materially fallen off. The protective tariffs of Germany, France, and Austria are rendering these countries good service in shielding them to a large extent from ruinous British competition, while Great Britain itself is compelled to face the competition of Germany and

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Belgium in other markets. Nevertheless, the depression on the Continent appears to be deepening, if we may judge from the following cable dispatches:

BERLIN, April 25.—The proprietors of the leading steel works in Prussia, including Herr Krupp, inform their workmen that over-production compels them to reduce the number of working hours. Some threaten to stop their works.

LONDON, April 29.—The Russian Minister of Finance attributes the gloomy condition of finance and trade in Russia to the competition of the United States, Canada, and India as exporters of wheat.

It will be apparent from the very full details we have given from authoritative sources that the year 1883 and that part of the present year which has already passed have witnessed a depression in the iron and steel industries of Europe as great, at least, as that which our own country has experienced in the same period. Production, it is true, as will hereafter be shown, has not seriously declined in Great Britain and on the Continent, but prices have seriously declined, and as the result wholly of increased capacity and over-production. The outlook for the maintenance in any European country of the rate of production that prevailed in 1883 is unfavorable. As misery is said to love company, our iron and steel manufacturers can comfort themselves with the reflection that their situation today is no worse than that of their European competitors. The whole truth, however, is that the whole world is just now making more iron and steel than it can use.

We now proceed to give such details as have come to hand concerning the progress of European and other countries in the manufacture of iron and steel and in the mining of coal in 1883.

## GREAT BRITAIN.

*Coal.*—According to the report of the Inspectors of Mines the production of coal in the United Kingdom in 1883 was 163,737,327 gross tons, against 156,499,977 tons in 1882—an increase of 7,237,350 tons. The increase last year was largest in Glamorganshire, where it amounted to 1,315,487 tons. Next comes Yorkshire, with an increase of 1,037,339 tons; then Scotland, with an increase of 710,663 tons; and next Lancashire and Monmouthshire, which contributed 704,672 tons and 623,542 tons respectively to the total increase. There was an increase in nearly every district. The production of coal in the United Kingdom from 1854 to 1883 has been as follows:

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| Years. | Gross tons. | Years. | Gross tons. | Years. | Gross tons. | Years. | Gross tons. |
|---|---|---|---|---|---|---|---|
| 1854.... | 64,661,401 | 1862... | 81,638,338 | 1870... | 110,431,192 | 1878... | 132,607,866 |
| 1855.... | 64,453,079 | 1863... | 86,292,215 | 1871... | 117,352,028 | 1879... | 134,008,228 |
| 1856.... | 66,645,450 | 1864... | 92,787,873 | 1872... | 123,497,316 | 1880... | 146,818,622 |
| 1857.... | 65,394,707 | 1865... | 98,150,587 | 1873... | 127,016,747 | 1881... | 154,184,300 |
| 1858.... | 65,008,649 | 1866... | 101,630,544 | 1874... | 125,043,257 | 1882... | 156,499,977 |
| 1859... | 71,979,765 | 1867... | 104,500,480 | 1875... | 131,867,105 | 1883... | 163,737,327 |
| 1860.... | 80,042,698 | 1868... | 103,141,157 | 1876... | 133,344,766 | | |
| 1861.... | 84,013,941 | 1869... | 107,427,557 | 1877... | 134,610,763 | | |

The exports of coal from Great Britain to foreign countries in 1883 amounted to 22,771,348 tons, against 20,934,448 tons in 1882—an increase of 1,836,900 tons. The exports of coal in 1883 for the use of British steamers amounted to 6,400,594 tons, against 5,575,160 tons in 1882—an increase of 825,434 tons. The following table gives the exports of coal from Great Britain to foreign countries (not including coal for the use of steamers engaged in the foreign trade) from 1868 to 1883.

| Years. | Gross tons. | Years. | Gross tons. | Years. | Gross tons. | Years. | Gross tons. |
|---|---|---|---|---|---|---|---|
| 1868... | 10,967,062 | 1872... | 13,198,494 | 1876... | 16,299,077 | 1880... | 18,719,971 |
| 1869... | 10,744,945 | 1873... | 12,617,566 | 1877... | 15,420,050 | 1881... | 19,587,063 |
| 1870... | 11,702,649 | 1874... | 13,927,205 | 1878... | 15,494,633 | 1882... | 20,934,448 |
| 1871... | 12,747,989 | 1875... | 14,544,916 | 1879... | 16,442,296 | 1883... | 22,771,348 |

The exports of coal from Great Britain are sent to almost every civilized country, even to countries which themselves are producers of coal. France is the leading foreign consumer of British coal, taking last year 4,476,995 tons of coal and coke, against 4,096,953 tons in 1882. Germany comes next, taking last year 2,425,298 tons, against 2,320,121 tons in 1882.

*Iron Ore.*—Complete statistics of the production of iron ore in Great Britain in 1883 have not been published, but the production is estimated by Mr. J. S. Jeans, the Secretary of the British Iron Trade Association, at 18,000,000 tons, which is about the quantity mined in 1882. The imports of iron ore into Great Britain in 1883 amounted to 3,178,310 tons, against 3,282,496 tons in 1882. The total consumption in 1883 approximated, therefore, 21,178,310 tons. Of the total imports of iron ore in 1883 Mr. Jeans says that 2,312,210 tons, or 73 per cent., were received from Bilbao. The highest price of Bilbao ore in 1883, free on board at Bilbao, was 7s. 6d. and the lowest price was 6s. 6d. About two tons of Bilbao ore are

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required to produce a ton of pig iron. The following table gives the total imports of iron ore into Great Britain from 1874 to 1883.

| Years. | Gross tons. | Years. | Gross tons. |
|---|---|---|---|
| 1874 | 754,000 | 1879 | 1,083,000 |
| 1875 | 458,000 | 1880 | 2,634,000 |
| 1876 | 672,000 | 1881 | 2,449,000 |
| 1877 | 1,140,000 | 1882 | 3,282,496 |
| 1878 | 1,173,000 | 1883 | 3,178,310 |

In 1866 British imports of Spanish iron ores amounted to only 27,619 tons, and in 1870 they amounted to only 179,083 tons.

A small quantity of iron ore is annually mined in Ireland, all in County Antrim. The quantity mined in 1881 amounted to 185,333 tons, and in 1882 to 189,724 tons.

*Pig Iron.*—The production of pig iron in Great Britain in 1883 was 8,490,224 tons, against 8,493,287 tons in 1882—a decrease of 3,063 tons. These figures are taken from the annual report of the British Iron Trade Association for 1883. The slight decrease in 1883 in the production of pig iron was the first that has occurred since 1879. Of the production of 1883 the Cleveland district contributed 2,760,740 tons; Scotland, 1,129,000 tons; West Cumberland, 876,410 tons, which was a large decrease upon the production of 1,001,181 tons in 1882; Lancashire, 820,633 tons; South Wales, 887,259 tons. There was an increased production in eight districts, and a decreased production in seven districts, the principal increase being in Cleveland, where it amounted to 72,090 tons, and the principal decrease being in West Cumberland.

Since the beginning of the present year the tendency in Great Britain has been to reduce the production of pig iron below that of last year. In the Cleveland district the total production in March last was 216,000 tons, against 237,000 tons in March, 1883. At the close of March last there were in blast in this district 102 furnaces, against 120 at the same time last year. In April the production was 12,240 tons less than in March. Furnaces have also been blown out in Scotland and in some other districts.

The stocks of pig iron held by manufacturers and in warrant stores at the close of 1883 amounted to 1,698,976 tons, against 1,658,120 tons at the close of 1882—an increase of 40,856 tons.

As unnecessary and unwarranted stress is frequently placed upon the number of furnaces that are out of blast in the United States from year to year it is of interest to note the fact that a large num-

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ber of the furnaces of Great Britain are also out of blast from year to year. The causes in both countries are in the main precisely the same, namely, greater producing capacity than is needed, the necessity of blowing out for repairs, and the inability of small and antiquated furnaces to make pig iron profitably in competition with large and modern furnaces. In the United States another reason exists which does not exist in Great Britain; many of our furnaces use charcoal fuel, and the practice of a majority of our charcoal pig iron manufacturers has always been to blow out a part of each year until a fresh supply of charcoal can be obtained. Occasionally, too, some of our small furnaces, which are operated by water-power, are compelled to stop because of a deficiency in the supply of water. The following table, which we obtain from the report of Mr. Jeans, will show the number of furnaces in blast and out of blast in Great Britain at the end of each year from 1875 to 1883.

| YEARS. | Furnaces built. | In blast. | Out of blast. |
|---|---|---|---|
| 1875 | 959 | 629 | 330 |
| 1876 | 927 | 585 | 342 |
| 1877 | 940 | 541 | 399 |
| 1878 | 948 | 498 | 450 |
| 1879 | 951 | 458 | 493 |
| 1880 | 959 | 590 | 369 |
| 1881 | 949 | 552 | 397 |
| 1882 | 926 | 565 | 361 |
| 1883 | 904 | 506 | 398 |

The production of spiegeleisen and ferro-manganese in Great Britain in 1883 amounted to 208,445 tons, against 194,125 tons in 1882.

The following table shows the growth of the pig-iron industry of Great Britain from 1740 to 1883.

| Years. | Gross tons. | Years. | Gross tons. | Years. | Gross tons. | Years. | Gross tons. |
|---|---|---|---|---|---|---|---|
| 1740... | 17,000 | 1839... | 1,347,790 | 1860... | 3,826,752 | 1873... | 6,566,451 |
| 1788... | 68,000 | 1840... | 1,396,400 | 1861... | 3,712,390 | 1874... | 5,991,408 |
| 1796... | 125,000 | 1842... | 1,099,138 | 1862... | 3,943,469 | 1875... | 6,365,462 |
| 1806... | 259,000 | 1844... | 1,999,608 | 1863... | 4,510,040 | 1876... | 6,555,997 |
| 1818... | 325,000 | 1845 | 1,512,500 | 1864... | 4,767,901 | 1877... | 6,608,664 |
| 1820... | 400,000 | 1847... | 1,999,508 | 1865... | 4,819,254 | 1878... | 6,381,051 |
| 1823... | 454,866 | 1852... | 2,700,000 | 1866... | 4,523,897 | 1879... | 5,995,337 |
| 1825... | 581,367 | 1854... | 3,069,838 | 1867... | 4,761,023 | 1880... | 7,749,233 |
| 1827... | 690,000 | 1855... | 3,218,151 | 1868... | 4,970,206 | 1881... | 8,377,364 |
| 1828... | 703,184 | 1856... | 3,586,377 | 1869... | 5,445,757 | 1882... | 8,493,287 |
| 1830... | 678,417 | 1857... | 3,659,477 | 1870... | 5,963,515 | 1883... | 8,490,224 |
| 1833... | 700,000 | 1858 .. | 3,456,064 | 1871... | 6,627,179 | | |
| 1835... | 1,000,000 | 1859... | 3,712,904 | 1872... | 6,741,929 | | |

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*Manufactured Iron.*—The total production of puddled bar iron in Great Britain in 1883 was 2,730,504 tons, against 2,841,534 tons in 1882—a decrease of 111,030 tons. Full particulars of the finished forms into which the puddled bar iron of Great Britain enters are not given by the British Iron Trade Association, but it is known that the production of iron rails did not exceed 50,000 tons in 1883, and that there was a large increase in that year in the production of iron for shipbuilding. In the production of finished iron Cleveland is the leading district, and it is closely followed by South Staffordshire.

*Bessemer Steel.*—The production of Bessemer steel ingots in Great Britain in 1883 was 1,553,380 tons, against 1,673,649 tons in 1882—a decrease of 120,269 tons. Mr. Jeans thinks it probable that 1883 was the first year since the beginning of the Bessemer steel industry in Great Britain in which there has been a decrease in the production of ingots. The production of Bessemer steel rails in Great Britain in 1883 was 1,097,174 tons, against 1,235,785 tons in 1882—a decrease of 138,611 tons. There were 80 Bessemer converters in operation at the end of 1882, and 84 in operation at the end of 1883. In 1882 there were 24 converters idle, and in 1883 there were 22 idle. At the close of 1883 there were 12 new converters in course of erection, six of which were in Scotland, which had not previously embarked in the manufacture of Bessemer steel. The average production of ingots per converter in 1883 was 18,492 tons.

The following table shows the production of Bessemer steel ingots in the United States and in Great Britain in the last four years.

| COUNTRIES. | 1880. Gross tons. | 1881. Gross tons. | 1882. Gross tons. | 1883. Gross tons. |
|---|---|---|---|---|
| Great Britain | 1,044,382 | 1,441,719 | 1,673,649 | 1,553,380 |
| United States | 1,074,262 | 1,374,247 | 1,514,687 | 1,477,345 |
| Excess of United States | 29,880 | ..... | ..... | ..... |
| Excess of Great Britain | ..... | 67,472 | 158,962 | 76,035 |

The following table shows the production of Bessemer steel rails in the United States and in Great Britain in the last four years.

| COUNTRIES. | 1880. Gross tons. | 1881. Gross tons. | 1882. Gross tons. | 1883. Gross tons. |
|---|---|---|---|---|
| United States | 852,196 | 1,187,770 | 1,284,067 | 1,148,709 |
| Great Britain | 739,910 | 1,023,740 | 1,235,785 | 1,097,174 |
| Excess of United States | 112,286 | 164,030 | 48,282 | 51,535 |

The production of Bessemer steel ingots and rails in Great Brit-

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ain in the last seven years, compared with the production of the United States in the same period, was as follows:

| YEARS. | Great Britain.—Gross tons. | | United States.—Gross tons. | |
|---|---|---|---|---|
| | Ingots. | Rails. | Ingots. | Rails. |
| 1877 | 750,000 | 508,400 | 500,524 | 385,865 |
| 1878 | 807,527 | 633,733 | 653,773 | 491,427 |
| 1879 | 834,511 | 519,718 | 829,439 | 610,682 |
| 1880 | 1,044,382 | 739,910 | 1,074,262 | 852,196 |
| 1881 | 1,441,719 | 1,023,740 | 1,374,247 | 1,187,770 |
| 1882 | 1,673,649 | 1,235,785 | 1,514,687 | 1,284,067 |
| 1883 | 1,553,380 | 1,097,174 | 1,477,345 | 1,148,709 |

The decreased production of Bessemer steel ingots and Bessemer steel rails in Great Britain in 1883 was mainly due to the decreased demand from the United States for blooms and rails.

*Open-Hearth Steel.*—The production of open-hearth steel in Great Britain in 1883 was 455,500 tons, against 436,000 tons in 1882—an increase of 19,500 tons. This was a very much smaller increase than had taken place in any of the three preceding years, the increase being 98,000 tons in 1882, 87,000 tons in 1881, and 76,000 tons in 1880. In 1883 Scotland produced 222,000 tons, and South Wales produced 136,000 tons. At the close of 1883 there were 42 firms engaged in, or about to engage in, the manufacture of open-hearth steel in Great Britain, and at the same time there were 175 completed open-hearth furnaces, against 168 in 1882. At the close of 1883 there were 21 new furnaces in course of erection, 11 of which were in Scotland. Mr. Jeans says that the best mechanical results have been obtained in Scotland, where the two leading firms obtained 179,633 tons in 1883 with 38 furnaces, being an average of 4,727 tons per furnace. This is a much better result than had ever before been realized in Great Britain.

*Crucible Steel.*—We are still without definite information concerning the production of crucible steel in Great Britain. A year ago we estimated the annual production as being less than 150,000 tons.

*Tinplates.*—The annual production of tinplates in Great Britain can only be estimated, not even the government agents being able to obtain complete information. The production of 1882 is supposed by these agents to have amounted to 5,944,633 boxes of tinplates, terne plates, and "black plates." The exports of tinplates in 1883 amounted to 4,815,009 boxes, against 4,564,549 boxes in 1882, a box weighing about 125 pounds. Reduced to gross tons the

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exports in 1882 amounted to 265,039 tons, and in 1883 to 269,367 tons. Of the exports in 1882 there were sent to the United States 3,565,249 boxes, and of the exports in 1883 the United States took 3,755,707 boxes. Canada comes next to the United States as a consumer of British tinplates. The value of the exports of tinplates from Great Britain in 1883 represented over 16 per cent. of the value of the total exports from that country of iron and steel.

*Prices in 1883.*—W. Fallows & Co., of Liverpool, publish the following table of prices of iron and steel in Great Britain at the beginning and end of 1883.

| Products. | January, 1883. | December, 1883. |
|---|---|---|
| | £ s. d. | £ s. d. |
| Scotch G. M. B. warrants | 2 9 0 | 2 3 0 |
| No. 3 Middlesbrough | 2 3 0 | 1 16 0 |
| No. 1, 2, and 3 hematite | 2 13 0 | 2 6 0 |
| Ship-plates (east coast) | 6 10 0 | 5 10 0 |
| Steel rails, f. o. b. shipping port | 5 0 0 | 4 5 0 |
| Welsh bars, f. o. b. Cardiff | 5 15 0 | 5 7 6 |

The prices of the above articles and of other articles in April of the present year were not so favorable as in December last. Manufactured iron has been especially depressed. Ship-plates and angles have fallen about 10s. per ton since the 1st of January; other descriptions are about 5s. per ton lower. Owing to severe competition galvanized sheets are 10s. lower.

*Iron and Steel Shipbuilding.*—The total gross tonnage of new ships launched in Great Britain in 1883 was 1,329,604 tons, against 1,240,824 tons in 1882, 1,013,208 tons in 1881, and 796,221 tons in 1880. Of the tonnage of 1883 there were built to Lloyd's survey the following vessels, aggregating 1,116,555 tons.

| Vessels. | Number. | Gross tonnage. |
|---|---|---|
| Steel | 109 | 166,428 |
| Iron | 644 | 933,774 |
| Wood | 95 | 16,353 |

The remainder of the tonnage of 1883 is not accounted for in detail in published statistics. On the 1st of January last there were under construction in Great Britain 729,446 tons of iron and steel ships, against 1,075,259 tons on the 1st of January, 1883—a decrease of 345,813 tons, or 32 per cent. The situation has grown worse since January.

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*Exports of Iron and Steel.*—The total exports of iron and steel from Great Britain in 1883 amounted to 4,044,273 tons, against 4,353,552 tons in 1882, 3,820,225 tons in 1881, 3,792,993 tons in 1880, and 2,883,484 tons in 1879. The decrease in 1883 as compared with 1882 was 309,279 tons. A further decrease in 1884 is clearly indicated. In the first four months of this year the exports were 1,077,310 tons, against 1,217,294 tons in the same period of last year. The exports in 1883 embraced the following items, which are given in comparison with the exports of 1881 and 1882.

| ARTICLES. | 1881. | 1882. | 1883. |
|---|---|---|---|
| | Gross tons. | Gross tons. | Gross tons. |
| Pig iron | 1,482,354 | 1,758,072 | 1,564,137 |
| Bar, angle, bolt, and rod iron | 294,361 | 313,155 | 287,900 |
| Railroad iron and steel (including fishplates, etc.) | 820,800 | 936,949 | 971,662 |
| Wire | 75,129 | 86,653 | 62,784 |
| Hoops, sheets, and boiler plates | 304,925 | 342,599 | 348,304 |
| Tinplates | 243,381 | 265,039 | 269,367 |
| Cast and wrought iron, etc | 291,754 | 328,262 | 355,868 |
| Old iron for remanufacture | 123,725 | 132,033 | 97,579 |
| Unwrought steel | 167,423 | 172,329 | 73,056 |
| Steel, or steel and iron combined | 16,373 | 18,461 | 13,616 |
| Total | 3,820,225 | 4,353,552 | 4,044,273 |

The distinction between iron and steel rails is not so carefully noted at British custom houses as it should be, but assuming the practical accuracy of the custom-house statistics of the exports of rails, it appears that in 1883 there were exported 25,000 tons of iron rails and 748,509 tons of steel rails, making a total of 773,509 tons. In 1882 the exports of iron rails were 46,824 tons, and in 1881 they were 120,221 tons. The exports of steel rails in 1882 were 734,959 tons, and in 1881 they were 595,911 tons.

It is a subject of frequent comment in British journals that the German wire makers have largely appropriated the foreign market for wire, to the injury of the British wire trade. On this subject Mr. Jeans gives us the following comparative figures: Wire exported from Germany in 1883, 203,627 metric tons; in 1882, 227,416 tons; decrease in 1883, 23,789 tons. Wire exported from Great Britain in 1883, 62,784 gross tons; in 1882, 86,653 tons; decrease in 1883, 23,869 tons.

The following table shows the destination of the iron and steel exported by Great Britain in 1882 and 1883, with the increase or decrease in 1883.

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| COUNTRIES. | Total Exports, 1882. | Total Exports, 1883. | Increase upon 1882. | Decrease upon 1882. |
|---|---|---|---|---|
| | Tons. | Tons. | Tons. | Tons. |
| United States | 1,195,116 | 688,187 | ..... | 506,929 |
| British North America | 246,516 | 229,454 | ..... | 17,062 |
| India | 274,925 | 350,347 | 75,422 | ..... |
| Australia | 302,450 | 345,831 | 43,381 | ..... |
| British South Africa | 56,951 | 57,282 | 331 | ..... |
| Russia | 162,952 | 154,354 | ..... | 8,598 |
| Germany | 351,887 | 367,116 | 15,229 | ..... |
| Holland | 329,267 | 263,017 | ..... | 66,250 |
| Belgium | 86,554 | 95,658 | 9,104 | ..... |
| France | 205,357 | 195,562 | ..... | 9,795 |
| Italy | 107,629 | 94,695 | ..... | 12,934 |
| Turkey | 9,762 | 12,047 | 2,285 | ..... |
| Sweden and Norway | 10,178 | 26,137 | 15,959 | ..... |
| Spain and Canaries | 32,002 | 44,249 | 12,247 | ..... |
| Egypt | 2,573 | 5,133 | 2,560 | ..... |
| Mexico | 44,011 | 35,953 | ..... | 8,058 |
| Brazil | 67,109 | 53,605 | ..... | 13,504 |
| Peru | 3,867 | 4,294 | 427 | ..... |
| Chili | 4,921 | 5,883 | 962 | ..... |
| Destinations not specified | 859,525 | 1,015,469 | 155,944 | ..... |
| Total | 4,353,552 | 4,044,273 | 333,851 | 643,130 |

The value of the total exports of iron and steel from Great Britain to all countries in 1883 was £28,584,253, against £31,598,306 in 1882, and £27,590,908 in 1881. The exports to the United States from 1879 to 1883 were as follows.

| ARTICLES. | 1879. | 1880. | 1881. | 1882. | 1883. |
|---|---|---|---|---|---|
| | Gross tons. | Gross tons. | Gross tons. | Gross tons. | Gross tons. |
| Pig iron | 277,939 | 614,005 | 394,934 | 488,970 | 282,924 |
| Bar, angle, etc | 20,648 | 51,413 | 18,858 | 22,445 | 8,738 |
| Rails | 44,919 | 221,131 | 292,617 | 198,275 | 75,461 |
| Sheets, plates, etc | 10,447 | 45,237 | 36,162 | 37,220 | 28,895 |
| Tinplates | 155,595 | 164,167 | 179,843 | 214,568 | 212,724 |
| Old iron | 188,705 | 197,653 | 99,859 | 95,583 | 46,022 |
| Cast iron, etc | 10,437 | 20,464 | 6,163 | 6,774 | 5,003 |
| Steel unwrought | 9,296 | 44,066 | 135,268 | 131,281 | 28,420 |
| Total | 717,986 | 1,358,136 | 1,163,704 | 1,195,116 | 688,187 |

Mr. Jeans calls attention to the fact that the decreased shipments to the United States in 1883 were more than compensated by the increased shipments to other countries. In the present year, however, shipments to other countries are also declining in the aggregate, while the volume of exports to the United States in 1883 is not being maintained.

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## GERMANY.

*Coal.*—The production of stone coal in Germany in 1883 was 55,888,490 metric tons, against 52,188,595 tons in 1882. The production of brown coal and lignite in 1883 was 14,334,966 tons, against 13,259,616 tons in 1882. The production of coal of all kinds in 1883 was 70,223,456 tons. The production of stone coal and of brown coal and lignite in Germany has been as follows from 1861 to 1883.

| Stone Coal. | | | | Brown Coal and Lignite. | | | |
|---|---|---|---|---|---|---|---|
| Years. | Metric tons. | Years. | Metric tons. | Years. | Metric tons. | Years. | Metric tons. |
| 1861..... | 14,133,000 | 1873..... | 36,392,300 | 1861..... | 5,084,400 | 1873..... | 10,739,500 |
| 1862..... | 15,576,300 | 1874..... | 35,918,600 | 1862..... | 5,459,500 | 1874..... | 10,367,700 |
| 1863..... | 16,906,700 | 1875..... | 37,436,400 | 1863..... | 6,203,900 | 1875..... | 11,096,000 |
| 1864..... | 19,409,000 | 1876..... | 38,454,400 | 1864..... | 6,758,100 | 1876..... | 10,700,300 |
| 1865..... | 41,794,700 | 1877..... | 37,524,600 | 1865..... | 6,533,100 | 1877..... | 10,930,100 |
| 1866..... | 21,629,800 | 1878..... | 39,589,800 | 1866..... | 6,994,800 | 1878..... | 11,445,000 |
| 1867..... | 23,808,100 | 1879..... | 42,025,700 | 1867..... | 7,174,400 | 1879..... | 12,144,500 |
| 1868..... | 25,704,800 | 1880..... | 46,973,566 | 1868..... | 7,569,600 | 1880..... | 12,144,469 |
| 1869..... | 26,774,400 | 1881..... | 48,688,161 | 1869..... | 7,605,200 | 1881..... | 12,852,324 |
| 1870..... | 26,397,800 | 1882..... | 52,188,595 | 1870..... | 8,482,800 | 1882..... | 13,259,616 |
| 1871..... | 29,373,300 | 1883..... | 55,888,490 | 1871..... | 9,018,000 | 1883..... | 14,334,966 |
| 1872..... | 33,306,400 | | | 1872..... | 9,752,900 | | |

The coal-producing States of Germany are Prussia, Bavaria, Saxony, Baden, Thuringia, Schaumburg, and Lothringen, while brown coal and lignite are raised in Prussia, Saxony, Anhalt, Brunswick, Thuringia, Hesse, and Bavaria. The most important coal-mining district of Germany and of Continental Europe is that of Dortmund, which comprises the coal basin of the Ruhr in Westphalia and Lower Rhineland. The next most important district is that of Bonn, comprising the coal basins of the Saar Valley and of Aachen.

*Iron Ore.*—The production of iron ore in Germany, including Luxemburg, was 8,736,426 metric tons in 1883, against 8,263,254 tons in 1882, 7,573,772 tons in 1881, and 7,238,640 tons in 1880. In 1883 there were 435,863 tons of ore imported from other countries, chiefly from Holland, Sweden, Spain, Italy, and Hungary. Bog ore is imported from Holland. The ore imported from Sweden is used in connection with the Thomas-Gilchrist process.

*Pig Iron.*—The production of pig iron by Germany and Luxemburg in 1883 was 3,397,588 metric tons, against 3,187,951 tons in 1882. The production of pig iron in Germany and Luxemburg in the last twelve years has been as follows:

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| Years. | Metric tons. | Years. | Metric tons. | Years. | Metric tons. |
|---|---|---|---|---|---|
| 1872..... | 1,988,394 | 1876..... | 1,846,345 | 1880..... | 2,729,037 |
| 1873..... | 2,240,574 | 1877..... | 1,932,725 | 1881..... | 2,914,009 |
| 1874..... | 1,906,262 | 1878..... | 2,147,641 | 1882..... | 3,187,951 |
| 1875..... | 2,029,389 | 1879..... | 2,226,587 | 1883..... | 3,397,588 |

Of the production of 1883 more than one-fourth is classed as Bessemer pig iron, divided as follows: Spiegeleisen, 122,180 tons; silicious or grey Bessemer pig iron, 495,920 tons; Thomas pig iron, 369,685 tons: total, 987,785 tons.

*Manufactured Iron.*—The production of manufactured iron in Germany in 1883 was 1,411,235 metric tons, against 1,423,629 tons in 1882, 1,421,792 tons in 1881, and 1,437,567 tons in 1880. The increasing use of Bessemer steel in Germany is given as the cause of the stationary condition of the manufactured iron trade.

*Steel.*—The production of the various kinds of steel in Germany in recent years is stated to have been as follows: 1880, 670,593 metric tons; 1881, 954,625 tons; 1882, 1,133,880 tons; 1883, 1,066,920 tons. These figures show a decreased production in 1883 of 66,960 tons. It is possible that they may require revision; the details which are published are certainly unreliable, and we do not give them. Friedrich Krupp is credited with the production of 230,000 tons of Bessemer steel at Essen in 1883.

*Prices in 1883.*—The range of prices per ton for iron and steel in Western Germany during 1883 is presented in the following quotations of the Dusseldorf Iron Exchange.

| Months. | White forge pig. | Bessemer pig. | Ordinary bars. | Steel rails. |
|---|---|---|---|---|
| | Marks. | Marks. | Marks. | Marks. |
| January..... | 60—62 | 68—70 | 135—145 | 152—160 |
| February..... | 62 | 65—66 | 130—140 | 152—160 |
| March..... | 62 | 65—66 | 130—140 | 152—160 |
| April..... | 62 | 65—66 | 130—140 | 152—160 |
| May..... | 62 | 65—66 | 130—135 | 148—155 |
| June..... | 56—57 | 61—62 | 128—135 | 148—155 |
| July..... | 53—55 | 58—60 | 128 | 148—155 |
| August..... | 55 | 57—58 | 125 | 144—151 |
| September..... | 55 | 57—58 | 125—128 | 140—151 |
| October..... | 55 | 57—58 | 125—128 | 140—151 |
| November..... | 52—54 | 55—57 | 118—125 | 140—150 |
| December..... | 50—53 | 55 | 113—120 | 140—150 |

*Imports and Exports.*—The following statement shows the imports and exports of iron and steel by Germany in 1882 and 1883.

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| DESCRIPTION. | Imports. | | Exports. | |
|---|---|---|---|---|
| | 1882. | 1883. | 1882. | 1883. |
| | Tons. | Tons. | Tons. | Tons. |
| Pig iron | 291,741 | 283,992 | 279,444 | 351,517 |
| Manufactured iron and steel | 41,470 | 43,075 | 787,150 | 788,614 |
| Machinery, etc | 31,219 | 34,081 | 84,799 | 92,374 |
| Total | 364,430 | 361,148 | 1,151,393 | 1,232,505 |

## LUXEMBURG.

The Grand Duchy of Luxemburg has no coal, and its blast furnaces are supplied with fuel from neighboring countries, principally from the Ruhr basin in Germany. It had 16 furnaces in blast in 1883, and their production of pig iron in that year was 361,765 metric tons, against 378,506 tons in 1882. These figures we have already embodied in the statistics of Germany, the two countries being united in the Zollverein. Luxemburg has but one iron rolling mill. The Thomas-Gilchrist process has been introduced into Luxemburg, and great expectations are entertained of the results of this process in the Grand Duchy, but statistics are wanting. Most of the pig iron produced in Luxemburg is consumed in Germany, which country it enters free of duty. The Belgian duty on pig iron is 5 francs per ton, and the French duty is 15 francs.

## FRANCE.

*Coal.*—The production of coal in France in 1883 was 21,446,199 metric tons, against 20,603,704 tons in 1882—an increase of 842,495 tons. Small quantities of anthracite coal and lignite are annually produced in France and are included above, the remainder being bituminous coal. France is also a large importer of coal and coke, aggregating about 10,000,000 tons in 1883, almost all of which comes from Great Britain and Belgium in about equal proportions.

*Pig Iron.*—The production of pig iron in France in 1883 was 2,067,387 tons, against 2,039,067 tons in 1882—an increase of 28,320 tons. Nearly all of the pig iron produced in France is made with coke, less than 100,000 tons being made with charcoal and mixed fuel in 1883. The production of pig iron in France in the last half of 1883 was 28,869 tons less than in the first half of the year, indicating a decreased production in 1884 as compared with 1883.

*Manufactured Iron.*—The production of manufactured iron in France in 1883 was 968,068 tons, against 1,073,021 tons in 1882—

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a decrease of 104,953 tons. Of the product of 1883 only 19,178 tons were iron rails. The production of iron rails in 1880 was 42,325 tons, in 1881 it was 28,468 tons, and in 1882 it was 27,016 tons. These figures show a steady decline in the production of iron rails in France, as in other countries.

*Steel.*—The production of steel in France in 1883 was 509,045 tons, against 458,238 tons in 1882—an increase of 50,807 tons. The steel product of France in 1882 and 1883 was classified as follows:

| Description. | Metric tons. | |
|---|---|---|
| | 1882. | 1883. |
| Bessemer steel | 273,410 | 329,462 |
| Open-hearth steel | 159,561 | 154,704 |
| Puddled steel | 14,258 | 14,034 |
| Cemented steel | 2,703 | 2,236 |
| Crucible steel | 7,921 | 7,235 |
| Reheated steel | 385 | 1,374 |
| Total | 458,238 | 509,045 |

These figures show an increase in 1883 in the production of Bessemer steel of 56,052 tons, and a practically stationary condition of all other branches. The production of steel rails in 1883 was 381,178 tons, against 380,259 tons in 1882. The remainder of the steel product in 1882 and 1883 went into consumption as merchant steel and plates. Of the steel rails produced in 1883, 32,532 tons were produced from Thomas-Gilchrist steel, the production of which is confined to the Meurthe-et-Moselle district.

*Imports and Exports.*—The following figures show the imports of iron and steel into France in 1882 and 1883 and the exports in the same years.

| Description. | Imports.—Metric tons. | | Exports.—Metric tons. | |
|---|---|---|---|---|
| | 1882. | 1883. | 1882. | 1883. |
| Pig iron | 286,062 | 308,171 | 70,936 | 67,198 |
| Finished iron | 82,756 | 70,580 | 25,241 | 31,736 |
| Steel | 46,016 | 40,949 | 6,069 | 4,066 |
| Total | 414,834 | 419,700 | 102,246 | 103,000 |

The imports of iron ore into France in 1883 amounted to 1,597,206 metric tons, against 1,425,878 tons in 1882, showing an increase of 171,328 tons. Spain, Germany, Algeria, and Italy, in the order named, furnish France with its foreign supplies of iron ore.

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*French Shipping Bounties.*—A statement prepared by the Minister of Marine shows that up to the 1st of January last the French government had paid in bounties to ship-owners under the Act of 1881 the sum of £667,843. Iron steam vessels received of this sum £463,240, iron sailing vessels, £52,441, and wooden sailing vessels, £152,162. The total number of iron-built steam vessels which received bounties was 141, of which 49 were built in France and 92 in foreign countries. Iron sailing vessels to the number of 59 received the bounties, of which 27 were of French and 32 of foreign build. Sailing vessels constructed of wood which received bounties numbered 563, of which 453 were French-built and 110 foreign. The total of these figures gives us 763 ships, of which 529 were of French and 234 of foreign build. The tonnage of the 763 vessels amounted to 453,038 tons, of which 253,814 tons belonged to the 529 French-built vessels, and 199,224 tons to the 234 foreign-built vessels. Of the 234 ships which were purchased abroad, 160 came from England, 27 from Italy, 22 from Canada, 12 from Germany, 3 from Austria, 3 from Spain, 3 from Sweden, 2 from the United States, 1 from Russia, and 1 from Norway. The number of miles run by these vessels, on which the amount of subsidy is calculated, was as follows: Iron steamers, 6,648,960; iron sailing vessels, 2,233,083; wooden sailing vessels, 15,002,568; total, 23,884,611.

*French Railroads.*—At the close of September, 1883, as appears from a French official return, there were 16,894⅜ miles of railroad in operation in France. The corresponding length of line in operation at the close of September, 1882, was 16,174⅜ miles, so that in the twelve months ended September 30th of last year 720 miles of new line were brought into operation.

## BELGIUM.

*Coal.*—The production of coal in Belgium in 1883 was 18,134,880 metric tons, against 17,485,000 tons in 1882, and 16,873,951 tons in 1881. The following table gives the production of coal in Belgium in the twelve years from 1872 to 1883.

| Years. | Metric Tons. | Years. | Metric Tons. | Years. | Metric Tons. |
|---|---|---|---|---|---|
| 1872..... | 15,658,948 | 1876..... | 14,329,578 | 1880..... | 16,866,698 |
| 1873..... | 15,778,401 | 1877..... | 13,938,523 | 1881..... | 16,873,951 |
| 1874..... | 14,669,029 | 1878..... | 14,899,175 | 1882..... | 17,485,000 |
| 1875..... | 15,011,331 | 1879..... | 15,447,292 | 1883..... | 18,134,880 |

Belgium exports a large proportion of its annual output of coal,

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almost the whole exportation going to France. In 1883 the total exports were 4,431,970 tons, of which France took 4,144,418 tons. Belgium also exports annually about a million tons of coke, principally to France. In 1883 the exports were 996,612 tons, of which France took 874,538 tons. About a million tons of coal and small quantities of coke are annually imported into Belgium, principally from Great Britain and Germany.

*Pig Iron.*—The production of pig iron in Belgium in 1883 was 770,659 metric tons, against 727,000 tons in 1882, and 624,736 tons in 1881. The number of furnaces in blast in 1883 was 38; in 1882 it was 33; in 1881 it was 34. During 1883 the price of forge pig iron in the Charleroi district fell from 60 francs in January to 55 francs in December. A large portion of the iron ore required by the blast furnaces of Belgium is supplied by the Grand Duchy of Luxemburg; Spain also contributes a liberal supply.

*Manufactured Iron.*—The production of finished iron in Belgium in 1883 was 478,023 tons, against 503,113 tons in 1882, a decrease of 25,090 tons. The production of 1883 was also slightly below that of 1880 and 1881.

*Steel.*—The official statistics of the production of steel in Belgium in 1883 have been kindly sent to us by M. J. Reuleaux, the Belgian consul at Philadelphia. The production of cast steel ingots in 1883 was 177,766 metric tons. Mr. Jeans quotes the same figures, but says that they do not embrace the Bessemer steel ingots that were produced by the works of Thy-le-Château, which would "probably bring up the total to from 200,000 to 220,000 tons." The Société John Cockerill has recently added two Siemens-Martin furnaces to its Bessemer plant, each with a capacity of 24 tons of steel per day, but they had not been put in operation in 1883.

*Imports and Exports.*—The imports of iron and steel, principally of pig iron, into Belgium in 1881 was 233,522 tons; in 1882 it was 217,322 tons; in 1883 it was 215,953 tons. The exports, almost wholly of manufactured iron and steel, were 349,573 tons in 1881, 384,267 tons in 1882, and 436,628 tons in 1883. Belgium, as has been shown, has recently increased its production of pig iron, and now we find that it is decreasing its imports of iron and steel and increasing its exports of these articles.

## SWEDEN.

Through the courtesy of Professor Richard Åkerman, of Stockholm, we are enabled to present full statistics of the production of

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iron and steel and iron ore in Sweden in 1880, 1881, and 1882. The statistics of production in 1883 have not yet appeared. The following table is compiled from Professor Åkerman's statistics, which are official and reliable.

| ARTICLES. | Metric tons. | | |
|---|---|---|---|
| | 1880. | 1881. | 1882. |
| Iron ore | 775,453 | 826,254 | 892,989 |
| Pig iron | 405,765 | 435,489 | 399,001 |
| Bar iron and rods | 219,265 | 247,742 | 259,499 |
| Bessemer steel | 30,017 | 39,334 | 47,365 |
| Martin steel | 7,719 | 11,159 | 13,407 |
| Other kinds of steel | 1,550 | 1,741 | 1,431 |
| Plates | 11,910 | 13,136 | 15,807 |
| Nails | 7,446 | 7,133 | 8,144 |

In 1881 there were 197 furnaces in blast in Sweden, and in 1882 there were 185 in blast. In 1881 the furnaces were unitedly in blast 44,677 days, and in 1882 they were in blast 40,157 days. In 1881 there were 28 Bessemer converters at work in Sweden, and in 1882 there were 30 at work.

*Exports.*—The following table gives the exports of iron and steel and iron ore from Sweden in 1882 and 1883. The latter year shows a decrease in the exports of pig iron, bar iron, and blooms, from which it may safely be inferred that the production of these articles in 1883 was less than in 1882.

| ARTICLES. | Metric tons. | |
|---|---|---|
| | 1882. | 1883. |
| Pig iron | 55,500 | 52,126 |
| Bar iron | 154,000 | 133,161 |
| Hoops, bands, etc | 54,000 | 61,678 |
| Blooms | 8,000 | 7,258 |
| Rails | 40 | 16 |
| Plates of all kinds | 2,200 | 2,373 |
| Nails, 1.6-inch and above | 900 | 827 |
| Iron ore | 20,200 | 34,319 |
| Steel | 9,800 | 11,214 |
| Machinery and implements | £142,000 | £143,000 |

The exports of iron ore from Sweden, which increased in 1883 over 1882, promise to be large in 1884, but the exports of most other articles in the table are declining. The following information concerning the increased shipments of iron ore from Sweden is taken from a late paper in *Iron* on the Swedish iron and steel industries.

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The great increase in the export of iron ore from Sweden is a matter of great interest to those connected with the iron trade. The greatest quantity of ore is obtained from the Grängesberg iron deposit in Central Sweden. The ore is magnetic iron, containing from 60 to 70 per cent. of chemical iron, and from ¼ to 1¼ per cent. of phosphorus. Last year nearly 8,000 tons of ore were shipped from this deposit alone to Upper Silesia and Westphalia, through the Rhine. The ore contains —according to the analysis of the buyers, which is generally under that of the shipper—64 per cent. of pure iron. This year several cargoes have also been shipped to Silesia, and even Austria, by the same route; and we are informed that the total shipments to be effected during the season will amount to 15,000 tons. The ore exported is free from sulphur, and contains only 3 per cent. of silicon, a circumstance of great advantage to the smelters. It can not, owing to the apatite (phosphorus) it contains, be used for the manufacture of high-class charcoal iron, but is exceedingly suitable for Thomas steel, and as a mixture in manufacturing pig iron for casting and puddling purposes.

*Prices.*—The price of best Swedish bar iron at the commencement of 1883 was £9 5s. to £9 10s. per ton, f. o. b. at Gothenburg, but as the year advanced prices receded to £9 and £8 15s. Pig iron was very low throughout the year, sales being effected at £3 10s. to £4 per ton, f. o. b. at Stockholm. In April last prices had not improved.

*Coal.*—But little coal is produced in Sweden, the southern province of Scania producing all that is mined, but the quantity increases from year to year. In quality it is classed as lignite. It is wholly used on southern Swedish railroads. The quantity mined in the last five years has been as follows, in cubic feet: 1878, 4,430,000; 1879, 4,884,000; 1880, 4,818,000; 1881, 5,634,000; 1882, 6,843,000.

*Finished Products.*—The same paper in *Iron* from which we have just quoted contains the following interesting details.

The finished iron and steel industry of Sweden shows considerable progress. The great progress in the industry of manufactured iron and steel goods is, no doubt, due to the exhibitions in Vienna and Madrid. At the former of these Indian officials came to the conclusion that the iron ploughs manufactured in Sweden would, on account of their lightness, good workmanship, and cheapness, be most suitable for use in India. The result of experiments made fully proved the correctness of this view, and large quantities of these are now yearly imported into Southern India. No doubt the exhibition in Calcutta will also contribute to the increase of the export of this article from Sweden to India. In Madrid, too, Sweden scored a great success last year, and, aided by a new treaty of commerce between the two countries, there is no doubt

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that Sweden may find an excellent market for her iron and steel goods in a country where those industries are in such a backward state. The horseshoe nail trade of Sweden has also improved during last year. The demand for those manufactured by the Uddeholm Company, for instance, has become so great that they have decided to erect a new factory for the exclusive make of this article at Hagfors, the number of machines being eighty. The cavalry of several European armies—for instance, the Spanish and Austrian—use now chiefly Swedish-made horseshoe nails. Most nails are made in Sweden by "clipping;" but new American machinery by which they are forged, which greatly increases their value, is now being introduced.

*Imports.*—Sweden imports nearly all the rails that are required by its railroads. In 1881 the imports of iron and steel rails from Great Britain amounted to 6,638 tons, and in 1882 they amounted to 9,387 tons. Sweden also annually imports more machinery than it exports.

### AUSTRIA AND HUNGARY.

The iron and steel industries of Austria and Hungary have been growing in importance for several years, partly through the extension of the railroad systems of the two countries and partly through the enactment of a protective tariff. The resources of the empire for the production of iron and steel are of wide extent and great value. It is the only iron-producing country in Europe whose iron and steel industries did not experience a severe check in 1883.

*Coal.*—The production of coal in the Austro-Hungarian Empire in 1881 was 6,343,315 metric tons, and the production of lignite in the same year was 8,961,498 tons, the total being 15,304,813 tons. The production of coal and lignite in 1882 is reported to have been 15,555,292 tons. In 1883 there was undoubtedly a large increase in the production of both coal and lignite, the total production aggregating probably 17,000,000 tons. There are annually imported into the empire about 2,000,000 tons of coal, and there are annually exported, principally to neighboring parts of Germany, about 600,000 tons. The leading coal-producing province in the empire is Bohemia, which in 1881 produced 6,450,996 tons of lignite and 3,417,632 tons of coal. In the same year Styria produced 1,640,154 tons of lignite, and Silesia 1,749,598 tons of coal.

*Pig Iron.*—The production of pig iron in Austria and Hungary in 1881 was 523,572 tons; in 1882 it was 573,516 tons; and in 1883 it was 655,221 tons. The production of pig iron in both countries in the last few years is given as follows by Wilhelm von Lindheim, of Vienna, in a recent paper in *Iron.*

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| Years. | Metric Tons. | Years. | Metric Tons. |
|---|---|---|---|
| 1873 | 534,565 | 1880 | 444,539 |
| 1876 | 400,425 | 1881 | 523,572 |
| 1877 | 388,230 | 1882 | 573,516 |
| 1878 | 434,250 | 1883 | 655,221 |
| 1879 | 404,160 | | |

Of the pig iron production of 1883 Austria produced 486,184 tons and Hungary 169,037 tons.

*Steel.*—The same authority from which we have above quoted gives the production of "steel generally" in the whole empire in 1883 as 271,733 tons. Much the larger part of this product was of course Bessemer steel.

*Rails.*—The production of steel rails in Austria and Hungary in 1883 is stated by the same authority to have been 146,972 tons, and the production of iron rails was only 2,254 tons.

*Imports and Exports.*—If pig and scrap iron are excepted, the iron and steel imports by Austria and Hungary in 1883 were unimportant. The quantity of pig iron imported amounted to 177,426 tons, against 92,934 tons in 1882. The quantity of scrap iron imported in 1883 amounted to 44,938 tons, against 37,627 tons in 1882. The large importation of pig and scrap iron in 1883 as compared with 1882 will probably not be repeated in 1884, as the prices of domestic pig iron are now much lower in Austria and Hungary than in the first half of 1883.

*Railroads.*—The statistics of the miles of new railroad opened to traffic in Austria and Hungary in recent years are as follows: From 1873 to 1882, both years inclusive, 6,901 kilometres, or 4,287 miles, of new railroad were opened. There were 1,031 kilometres, or 640 miles, opened in 1883, showing a great advance upon the average of the preceding ten years.

## SPAIN.

*Iron Ore.*—The exports of iron ore from Spain to more enterprising countries in 1883 amounted to 4,225,938 metric tons, against 4,025,234 tons in 1882. Of these totals there were exported from Bilbao 3,378,234 tons in 1883, against 3,692,542 tons in 1882. The shipments from Bilbao in 1883 were to the following countries: Great Britian, 2,312,210 tons; Holland, (principally for Germany,) 454,463 tons; France, 461,943 tons; Belgium, 141,918 tons; Corsica, 1,476 tons; United States, 6,224 tons. Contrary to the general belief, very little iron ore from Bilbao comes to the United

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States. Our imports of foreign iron ore mainly come from the south of Spain, from Elba, and from Africa.

*Manufactures of Iron and Steel.*—At Bilbao and in the neighborhood of that city are several blast furnaces and two rolling mills. The furnaces produce about 100,000 tons of pig iron annually, and the rolling mills about 10,000 tons of rolled iron. Other blast furnaces and a Bessemer and open-hearth plant at Bilbao are projected, and it is possible that in a few years Spain will have an iron industry and a steel industry that will do justice to the native iron-producing resources that are the wonder of the metallurgical world, and that will restore to it the enviable reputation it once enjoyed as an iron-manufacturing country.

The following detailed information concerning the manufacture of iron and steel at Bilbao is taken from a letter written from that place in the latter part of 1883.

The iron industry of the place has been increasing very much lately, and in the following are some particulars about the principal iron works. The oldest works are those de Santa Ana de Bolueta, which have existed since 1841, and are about 3 miles from Bilbao; they have three blast furnaces, seven puddling furnaces, and three furnaces after the Siemens system, which are heated by the gas of the blast furnaces; they produce about 6,500 tons of iron bars, and 1,000 tons of different iron articles per year. The works of Nuestra Señora del Carmen are situated at the end of Baracaldo; they consist of three large blast furnaces, two smaller ones, which work with coke, and twenty-five puddling furnaces; they consume about 35,400 tons of Somorrostro ore, and produce with it 17,500 tons of pig iron, 10,720 tons of bar iron, and 8,890 tons of steel. They have working twenty-four steam engines, 1,000-horse power. The works belonged formerly to Ybara & Co., but now they form part of the lately established company, Sociedad de Altos hornos y Fabricas de hierro y accro de Bilbao, which are going to produce not only iron but also steel on a large scale. 943 workmen are occupied by them. The San Franzisco Desierto Works belong to the Marquess of Mudela; they consist of four large blast furnaces worked with English coke, twelve steam boilers, twelve Whitwell apparatus.

A number of smaller works with one blast furnace, of no great importance, are not worth mentioning. A large company named Vizcaya, with a capital of 50,000,000 francs, has just been started. They will work with four large furnaces, producing 100,000 tons of pig iron per year, half of which will be converted into steel rails by their own rolling mills. They will manufacture, too, boilers, engines, etc. If these works commence the greater part of the Spanish market will be lost to the English ironmasters. The Spanish pig is now already exported in considerable quantities to Germany, and quoted regularly there at the Exchange of Dusseldorf.

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In the whole of Spain there were produced in 1880 85,939 tons of pig iron and 49,021 tons of wrought iron. Since that year, as is shown above, the iron industry of Spain has been somewhat enlarged on its northern boundary.

*Imports.*—The imports of iron into Spain in 1883 amounted to 106,371 tons, against 97,417 tons in 1882. The imports of steel are said to have amounted to only 1,051 tons in 1883, against 17,002 tons in 1882. The imports of machinery in 1883 were 22,113 tons, against 25,455 tons in 1882.

*Exports.*—The exports of "finished iron" from Spain in 1883 are given as 47,323 tons, against 40,131 tons in 1882. The phrase "finished iron" includes pig iron and probably very little else than pig iron.

## ITALY.

This country is well known to be rich in iron ore, but poor in both charcoal and mineral fuel; hence its supply of iron and steel is mainly drawn from other countries. Such prominence as Italy possesses among iron-producing countries is due primarily to its exportation of the celebrated iron ores of Elba, and next to its exportation of iron ores from the mainland.

*Iron Ore.*—Reliable statistics of the production of iron ore in Italy do not come down to a later period than 1880. The total production in that year on the mainland was 289,058 metric tons, against 186,857 tons in 1879. In addition there were also produced 20,471 tons of ferro-manganese ore, against only 1,388 tons in 1879. The principal iron-ore mines on the mainland are in Lombardy. The production of iron ore in Elba in 1880 was 403,215 tons, against 274,322 tons in 1879. The following table gives the production of iron ore in the whole of Italy in recent years, and also the exports to other countries.

| Years. | Production.—Metric tons. | | Years. | Exports.—Metric tons. | |
|---|---|---|---|---|---|
| | Mainland. | Elba. | | Mainland. | Elba. |
| 1851 | ..... | 22,014 | 1851 | ..... | 22,663 |
| 1860 | 82,708 | 40,687 | 1860 | 13,214 | 54,440 |
| 1870 | 89,248 | 50,801 | 1870 | 44,190 | 47,765 |
| 1875 | 227,547 | 197,540 | 1875 | 156,537 | 202,912 |
| 1876 | 231,790 | 196,220 | 1876 | 194,700 | 182,545 |
| 1877 | 229,732 | 155,155 | 1877 | 182,550 | 180,740 |
| 1878 | 189,721 | 173,177 | 1878 | 190,582 | 202,966 |
| 1879 | 186,857 | 274,322 | 1879 | 198,365 | 297,663 |
| 1880 | 289,058 | 403,215 | 1880 | ..... | 330,144 |

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This table shows a total production of iron ore in Italy in 1880 of 692,273 tons, against 461,179 tons in 1879. It is not probable that the increase in 1880 over 1879 has been maintained in more recent years. Of the exports of iron ore from Elba the United States annually takes about 100,000 tons.

*Iron and Steel Manufactures.*—About the middle of this century there were on the mainland of Italy many small furnaces and forges which used charcoal, but their number has in late years rapidly declined. It is said that only six of these old charcoal furnaces are now in operation. The following comprehensive view of the present condition of the manufacture of iron and steel in Italy, exclusive of the unimportant operations of the few old charcoal furnaces and forges that yet survive, is taken from a recent paper in the *Colliery Guardian.*

The iron industry is concentrated in a few large works working with Siemens and puddling furnaces, where they can use peat and brown coal, employing the gas generators. There are at present about fifteen Siemens furnaces in Lombardy; besides these, some were built lately by the Masson Ironworks in the Elsa Valley, the Societa Romana, and the firm Lucovich, at Terni, and, further, by the works San Giovanni in the Arno Valley. Some new works, the Perseveranza and the Magona d'Italia, were started some time ago; the first mentioned has Bessemer converters and rolling mills, the second two Bessemer converters. Works producing ferro-manganese and spiegel iron are at Ponti Rifredi, near Florence, where great quantities of manganiferous ores are found. Besides these, several works are in Liguria and Savona, close to the sea, which are melting old iron, and compete very well with the other works, as they can get the old iron and coal very cheaply from abroad. Including the production of these works, the total amounts only to 40,000 tons pig iron, which is not much considering that the railways and arsenals of the navy in Italy consume alone 35,000 tons.

The writer of the paper from which the above extract is taken supposes that the old charcoal furnaces produce annually about 13,000 tons of pig iron, so that the total pig-iron product of Italy in 1883 may be placed at 53,000 tons. We are without information concerning the probable production in recent years of manufactured iron and steel in Italy, but an official statement places the total production of pig iron, manufactured iron, and steel in 1880 at 60,000 tons. A movement is said to have been set on foot by Messrs. Schneider & Co., of Creuzot, in France, to establish in the north of Italy works for the manufacture of steel rails to supply the home demand.

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*Wages.*—From a consular report on the industries of the province of Rome, dated November 6, 1883, we learn that since 1877 an iron manufactory of some importance has been working near Corneto-Tarquinia, close to the seaboard, with the island of Elba within easy reach. It manufactures iron bars, round iron, etc., and uses lignite under Siemens furnaces. Wages at these works in 1883 were as follows:

In the ironworks of Corneto work is done on twenty-four or twenty-five days of the month, and alternately on as many nights, wages being £6 8s. to furnacemen, £7 4s. to master workmen, monthly. Men employed in bar-making receive wages varying from 2s. 10d. to 4s. 10d. a day; day laborers from 1s. 5d. to 1s. 10d. a day. In other workshops the day's work is of ten hours' duration, with an interval for meals, which is according to the season, and even of three hours' length in summer. The workmen at the turning-lathes receive from 2s. 10d. to 3s., the forgemen from 3s. 2d. to 4s. 10d., the foundrymen and earth-modelers from 2s. to 6s. 5d., the assistant workmen from 1s. 7d. to 2s., and apprentices from 5d. to 1s. 2d. a day. For smiths the day's work is ten hours, with an interval which may be of two hours. Master smiths are paid 2s. to 3s. 2d.; assistants, 10d. to 1s. 5d.; apprentices, 2½d. to 7d. per day.

*Italian Railroads.*—In the five years ending with 1881 there were 452 miles of new railroad constructed in Italy, which made the total mileage of the kingdom amount to 5,449 miles, the average cost of which per mile was £19,825. In addition to other railroad enterprises undertaken since 1881 there is now in course of construction a railroad from Rome to Sulmona, which passes by Tivoli, Arsoli, Tagliacozzo, and Avezzano. It will communicate with the line of the Adriatic coast at Pescara, and more internally with the line of Aquila, Rieti, and Verni. The city and the province of Rome expect to derive great benefit from this important line, which will bring both into immediate communication with territories fertile in products and with robust populations.

*Imports of Coal.*—In 1880 Italy imported 1,737,746 tons of coal and coke, and in 1883 the country imported from Great Britain alone 2,227,946 tons.

## RUSSIA.

Statistics of the iron and steel industries of Russia do not come down to a later period than 1881. In that year the production of iron ore in Russia was 1,001,089 gross tons; of pig iron, 462,042 tons, 196 furnaces being in blast; of manufactured iron, 322,090 tons, of which 1,884 tons were iron rails; of Bessemer and Siemens-

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Martin steel, 285,092 tons; of blister and puddled steel, 3,577 tons; of crucible steel, 3,691 tons; of steel rails, 203,310 tons. The production of coal in Russia in 1881 was 3,437,840 tons, of which 534,244 tons were anthracite and 17,008 tons were brown coal; the remainder was bituminous.

The reader's attention will be arrested by the large production of Bessemer and Siemens-Martin steel in Russia in 1881—285,092 tons, most of which was doubtless converted into steel rails, which were not made in Russia until 1876. The total production of steel in Russia in 1881 was 292,360 tons, a quantity larger than the total production of steel in the United States at as late a period as 1874, when our production was 241,614 net tons. Russia is certainly making rapid progress as a producer of steel. Eight works in Russia are engaged in producing Bessemer and Siemens-Martin steel.

*Imports.*—Russia exports but little iron and less steel. It imports, however, considerable quantities of both products and some coal. In 1881 it imported 226,500 tons of pig iron, 110,277 tons of wrought iron, 23,222 tons of steel and steel rails, and 1,729,801 tons of coal. These figures are all smaller than the corresponding figures for 1880.

## FINLAND.

From a very interesting report for the year 1880, recently issued by the Mineral Department of the Finnish government, we glean the following particulars concerning the iron industry of this country.

*Iron Ore.*—In the year mentioned 180 tons of iron ore were obtained from the mines of Finland and 38,100 tons from its lakes. In the same year 18,360 tons were imported. No iron ore was exported.

*Pig Iron.*—In 1880 there were produced in Finland 23,000 tons of pig iron, and there were imported 8,694 tons and exported 10,630 tons. There were 27 furnaces in Finland in 1880, of which 15 were in blast.

*Manufactured Iron and Steel.*—In 1880 Finland produced 15,000 tons of blooms, 15,717 tons of bar iron, 21 tons of plate iron, 655 tons of merchant iron, 1,055 tons of nails, and 548 tons of Siemens-Martin steel. There were 13 rolling mills in Finland in 1880, of which 7 were in operation, and 82 puddling furnaces, of which 52 were in operation. Included in the imports of the year were 8,800 tons of steel rails. The exports of bar iron and merchant iron amounted to 8,316 tons, and the imports to 1,729 tons. The total

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imports of iron and steel in 1880 amounted to 28,775 tons, and the total exports to 23,685 tons. The imports of coal in 1880 amounted to 33,500 tons. Charcoal is the principal fuel used in the manufacture of iron in Finland.

Statistics for 1881 do not materially vary from those given above for 1880.

## NEW SOUTH WALES.

*Coal.*—There were 39 coal mines in operation in New South Wales during the year 1882. The total output was 2,109,282 tons, valued at £948,965. The production of the northern coal fields amounted to 1,569,517 tons, the average price per ton being about 9s. 1½d. The quantity raised from the southern and western fields was 539,765, of the value of £233,028, which gives an average of 8s. 7½d. per ton. The development of the coal fields of New South Wales has been as follows since 1829.

| YEARS. | Production. | Exports to inter-colonial ports. | Exports to foreign ports. | Home consumption. |
|---|---|---|---|---|
| | Gross tons. | Gross tons. | Gross tons. | Gross tons. |
| 1829 | 780 | ..... | ..... | ..... |
| 1840 | 20,256 | ..... | ..... | ..... |
| 1850 | 71,216 | ..... | ..... | ..... |
| 1855 | 137,076 | ..... | ..... | ..... |
| 1860 | 368,861 | 140,183 | 93,694 | 134,985 |
| 1865 | 585,525 | 292,664 | 90,304 | 202,556 |
| 1870 | 868,564 | 335,564 | 242,825 | 267,681 |
| 1875 | 1,329,729 | 518,853 | 408,154 | 402,722 |
| 1880 | 1,466,180 | 550,672 | 202,684 | 712,824 |
| 1881 | 1,769,597 | 657,135 | 372,709 | 759,753 |
| 1882 | 2,109,282 | 760,226 | 501,319 | 847,737 |

New South Wales finds foreign markets for much of its coal in the Pacific ports of the United States, but it also sends considerable quantities to China and Japan, India, Ceylon, and Mauritius.

*Iron.*—The only iron works in New South Wales that have recently been active are those of the Eskbank Iron Company, in Lithgow Valley, which were undertaken in 1875. These works consist of a blast furnace, a foundry and forge, and a rolling mill. The smelting and finishing departments are connected by a horse tramway. Most of the plant, including a 24-ton fly-wheel, was made on the ground. The blast furnace is capable of producing 100 tons of gray iron or 115 tons of white iron per week. Large quantities of rails for tramways have been rolled at these works. Upon the company's prop-

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erty are iron ore, coal, fire-clay, and moulders' sand. In 1882 the company made 4,320 tons of pig iron, against 2,737 tons in 1881; finished iron, 2,139 tons, against 3,351 tons in 1881; and castings, 1,016 tons, against 220 tons in 1881. The Fitzroy Iron Works, at Mittagong, which have been abandoned for some time, are the only other iron works in the colony.

*Railroads.*—There are now over 1,200 miles of railroad in operation in New South Wales, and over 500 additional miles are in course of construction. The government of the colony offers inducements to British capitalists to establish the manufacture of steel rails within its territory, but thus far its liberal offers have not been accepted.

### NEW ZEALAND.

In our last annual report we referred to the establishment at Onehunga of an iron works for the utilization of the iron sand which is found in such large quantities on the shores of New Zealand. The furnace used in the reduction of this sand is the invention of Joel Wilson, of New Jersey. The enterprise when last heard from in 1883 gave promise of complete success. The fuel used is charcoal. There is an abundance of iron ore, of various qualities, in all parts of this island, and coal is not wanting.

*Imports.*—Very few persons are aware of the vast extent of the iron and steel imports of this colony. The value of the imports, exclusive of machinery, steam engines, and ironmongery, during the year 1881 reached the sum of $2,204,400, against $1,604,820 for 1880; showing an increase of $599,580 for 1881. The value of the imports of machinery, steam engines, and ironmongery during 1881 showed a corresponding increase, and reached the sum of $1,856,250, thus swelling the total value of iron imports in 1881 to the sum of $4,060,650.

*Railroads.*—At the beginning of 1883 there were 1,258 miles of railroad in operation in New Zealand, and 200 additional miles were then in course of construction.

### AUSTRALASIAN RAILROADS.

We have given above some details of the railroad systems of New South Wales and New Zealand. We now add that the railroad system of Victoria embraced 1,199 miles at the beginning of 1883, and that at the same period the total number of miles constructed in all Australasia was 4,851, while 1,189 additional miles were in course of construction, making a total of over 6,000 miles of rail-

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road. An Anglo-Saxon empire is growing up in this part of the world that will soon surprise other civilized countries with the magnitude of its achievements.

### INDIA, CHINA, AND JAPAN.

In connection with the proposed extension of railroads in India it is worthy of notice that this country now supplies its railroads with the larger part of their supply of coal. British coal costs at Madras and Bombay from $6.75 to $7.50 per ton. It is a much more efficient fuel than the native coal, the cost of which at the pit's mouth is from $1.75 to $2.25 per ton. In 1881 the output of coal from the 66 mines in operation in Bengal was 930,203 tons, against an average of 878,376 tons for the three previous years; in the same year the Central Provinces yielded 67,527 tons, against an average in the three previous years of 43,413 tons. In Assam there is said to exist a body of coal amounting to 40,000,000 tons.

A recent official statement concerning the material progress of India contains the following reference to iron:

> In almost every part of India iron ore has been found, and in most parts of the country it has been worked on a small scale. In very few places, however, has it yet been found co-existent with sufficient supplies of coal, or of wood of good quality, and the result is that this branch of industry has not been able to bear up against the competition of the cheap English iron. Nor does there seem to be any near prospect of the native manufacture assuming large dimensions, and the official opinion is that there are only three probable centres of iron manufacture on a large scale by the agency of English capital, viz., (1) the Bengal Iron Works, (2) the Jubbulpore district, (where trial borings as to the extent and thickness of the coal beds are stated to be very promising,) and (3) the Chando coal and iron fields.

China gives to the outside world no statistics of its industries, and we are consequently without reliable information concerning the extent to which it has carried the mining of coal and the manufacture of iron. The most important coal mines in China of which positive information exists are the Kaiping mines, located about 71 miles north-northeast from Tientsin, which recently employed 1,000 men. This is an English venture. The coal obtained from the Kaiping mines is bituminous, but of inferior quality. It is much in demand, however, and it is said that 500 tons per day could easily be disposed of. This is more than the present capacity of the mines. The coal from the mines reaches a market by means of a canal, about twenty-five miles long, and a railroad seven miles long. This rail

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road is the only railroad in China. It will be remembered that a few years ago the Chinese government tore up a short line of railroad, the Woosung road. The United States consul at Tientsin says of the new road: "The Chinese residing in the vicinity of the road, outside of those whose land was taken, look upon it with much favor, and are disposed to patronize it. There can be but little doubt that the establishment of railways in China may be regarded as a fixed fact, and the present road will be the nucleus of a great system of roads, which will be built in the near future."

Japan is increasing its importation of iron, chiefly bar iron, from year to year, its supplies coming mainly from Great Britain, Germany, and Belgium. We are without late statistics. The country produces but little iron, and the small quantity produced is more expensive than foreign iron. It is stated, however, that large iron works will shortly be opened by a Japanese capitalist at Kobe, and that several hundred experts, trained at the Akabane Iron Works and elsewhere in Tokio, have been engaged by the projector. Iron ore of a very fine quality having been obtained from the Shimonida mine, it will be employed hereafter for forging the armor of war vessels built by the Imperial Naval Department. In former annual reports we have referred to iron enterprises on a large scale that have been projected or undertaken in Japan, but particulars concerning their subsequent history are not at hand.

### NORTH AND SOUTH AMERICA.

But little information of a reliable character is at hand concerning the progress that is being made by neighboring countries on this continent in the development of their coal and iron resources. From Canada we hear nothing of an encouraging nature in relation to its iron industry. The production of coal in Nova Scotia in 1883 was 1,422,553 gross tons, against 1,365,811 tons in 1882. The production of coal on Vancouver's Island (British Columbia) in 1883 is placed at 300,000 tons, against 335,000 tons in 1882. A scheme for the manufacture of iron in Manitoba, with the aid of the Dominion government, has been set on foot, but it is hardly probable that it will receive serious consideration except by the promoters of the "enterprise."

Mexico is indebted to American capital and enterprise for the inception of an ambitious scheme to develop the wonderful iron-ore deposits of the iron mountain of Durango. A company has been organized, with a proposed capital of one million dollars, to build a

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blast furnace, foundry, rolling mill, machine shops, etc., at Durango. The office of the company is at Chicago. Its president, the Hon. William L. Helfenstein, of New York, has recently died, and Mr. John Gibson has been chosen in his stead. We learn from Mr. John Birkinbine, the engineer of the company, that the blast furnace will be erected this year.

We can learn of only two blast furnaces that are now in operation in Mexico—the Piedra Azal Iron Works, in the State of Durango, and the Tula Iron Works, in the State of Jalisco. The government of Mexico has recently published a list of the localities in Mexico where coal is found.

At Samaca, in the United States of Columbia, South America, the erection of a rolling mill, said to be the first in South America, and a blast furnace was undertaken a few years ago by the government of the State of Boyaca, in which Samaca is located. The furnace and rolling mill were put in operation during the past year.

### THE WORLD'S PRODUCTION OF PIG IRON, STEEL, AND COAL.

The following table gives the production of pig iron, steel, and coal in the iron and steel producing countries of the world in the most recent years for which statistics are available. English tons of 2,240 pounds are used in giving the statistics of Great Britain, the United States, Russia, and "other countries," and metric tons of 2,204 pounds for all the Continental countries of Europe except Russia. As the difference between the gross ton and the metric ton is so trifling it is not necessary to change official figures.

| COUNTRY. | Pig iron. | | Steel. | | Coal. | |
|---|---|---|---|---|---|---|
| | Year. | Tons. | Year. | Tons. | Year. | Tons. |
| Great Britain | 1883 | 8,490,224 | 1883 | 2,158,880 | 1883 | 163,737,327 |
| United States | 1883 | 4,595,510 | 1883 | 1,673,534 | 1883 | 96,159,719 |
| Germany and Luxemburg | 1883 | 3,397,588 | 1883 | 1,066,920 | 1883 | 70,223,456 |
| France | 1883 | 2,067,387 | 1883 | 509,045 | 1883 | 21,446,199 |
| Belgium | 1883 | 770,659 | 1883 | 220,000 | 1883 | 18,134,880 |
| Austria and Hungary | 1883 | 655,221 | 1883 | 271,733 | 1882 | 15,555,292 |
| Russia | 1881 | 462,042 | 1881 | 292,360 | 1881 | 3,437,840 |
| Sweden | 1882 | 399,001 | 1882 | 62,203 | 1882 | 250,000 |
| Spain | 1880 | 85,939 | 1873 | 216 | 1880 | 847,128 |
| Italy | 1883 | 53,000 | 1876 | 2,800 | 1882 | 220,000 |
| Other countries | 1882 | 100,000 | 1883 | 20,000 | 1883 | 8,000,000 |
| Total | ..... | 21,076,571 | ..... | 6,277,691 | ..... | 398,011,841 |
| Percentage of the United States | ..... | 22 | ..... | 27 | ..... | 24 |

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